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AUTOMOTIVE INDUSTRIES

February 29, 1936

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Barit Confirmed As Hudson Head

Baits Becomes First Vice-President; Board Names Other Officers

At a meeting of the board of directors Tuesday, A. Edward Barit was elected president of the Hudson Motor Car Co. to succeed the late Roy Chapin. Mr. Barit, who was first vice-president, treasurer and general manager, has been with the Hudson Motor Car Co. from its inception, and since Mr. Chapin's return to the presidency in 1933 at the expiration of his term as Secretary of Commerce, these two executives had been jointly responsible for the management and policy of the company. Mr. Barit also attained the title of general manager.

In succeeding to the presidency, Mr. Barit has received the highest position in a company with which he became connected as a boy of 20. His career is an outstanding example of the opportunity afforded by the auto-

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Ford Improving Rouge Plant's Gas System

Plans for handling greatly increased quantities of fuel gas for departments of the Rouge Plant of the Ford Motor Co., embracing construction of a new 10,000,000 cu. ft. gas holder, installation of a propane gas mixing station and improvement and enlargement of gas pipe lines were announced this week at the company's offices.

Coupled with the gas system improvement is a $4,000,000 coke ovens expansion program which will increase by 8,000,000 cu. ft. a day the output of gas for general plant use. An electrically operated supervisory control system will provide automatic and remote control of all gas consumption points in the Rouge Plant by a single dispatcher. This is believed to be the first application of such a control unit to an industrial gas system.

The plant's gas compressor capacity will be increased from 36,000,000 cu. ft. a day to 56,000,000 cu. ft. a day by the installation of a new 20,000,000 cu. ft. compressor.

The propane mixing station already completed, will be called upon to meet

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Dealers Again Plan To Run Chicago Motor Show

The Chicago annual automobile show will again be run by dealers, it is reported. This ends speculation as to whether the Automobile Manufacturers Association would resume management of it this year.

The New York show will probably be kept open on Sunday contrary to the practice of recent years. Present indications are that most of the local shows will be held during November, with very few in December.

W.-O. Receivership Ends After 3 Years

Reorganization to Proceed Under Section 77-B; David R. Wilson Elected President

The receivership of Willys-Overland Co., in effect three years, was ended Tuesday when Judge George P. Hahn in Federal Court granted an application under Section 77-B of the Federal Bankruptcy Act and named David R. Wilson trustee. Application was filed by Harold W. Fraser, attorney for the reorganization committee formed by the late John N. Willys, and also counsel for the creditors' committee.

Directors of the company elected Wilson president and a director at a special meeting Monday afternoon and approved the plan for lifting the receivership.

It was pointed out that operations

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Sales Rising With Warmer Weather

Past Week Shows Gain and Month's Sales May Exceed Those Year Ago

By Harold E. Gronseth

The predictions of automobile executives for a sharp upswing in business this spring apparently will be realized if the first few days of good weather are an indication. One of the leading finance companies noted a "very substantial lift" in its business nationally starting Monday this week, when a great portion of the country experienced its first relief from the record cold snap and heavy snows. A Detroit dealer reported that "last week-end was the best in six months."

The feeling is general throughout the industry that when the turn comes it will come with a bang. And from the scattered reports already available it is evident that demand for motor cars is straining at the leash. Dealers are said to be holding a goodly

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Simpson Outlines Pontiac's Dealer Organization Policies

C. P. Simpson, Pontiac's new general sales manager, outlined some of his policies at a luncheon to representatives of the press Thursday. "What we are interested in is the quality of the dealer, not an excess number of them," said Mr. Simpson.

"Let me say that Pontiac's dealer organization has improved materially in the last year. We show a large increase in the number of exclusive Pontiac dealers. Most important in this policy affecting our dealers and an essential to their success, is the dealer's confidence in the Pontiac franchise. We propose to build this confidence to the highest point, and we are only interested in one type of dealer from whom we hope to gain that confidence, and that is the substantial, well-financed dealer. It is impossible to make a great success in this motor car industry except with dealers whose high reputation matches that of the product and of the plant. We are not interested in curb-stone operators.

"Having named the type of dealer we desire, it is impossible to attract him

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Farm Income Found Stable Through Year

No Peak in Crop Sales, According to Survey of Farm Equipment Institute

By George Applegren
Special to Automotive Industries

The theory which has always governed farm credits, that farm incomes are confined entirely to a brief month or six weeks period in the late fall or early winter, is about to be exploded.

A survey which has just been completed by Harry G. Davis, director of research and statistics for the Farm Equipment Institute, reveals that incomes on farms are as consistent and as stable throughout any given 12-month period as are the incomes of salaried city workers. The survey covers five years.

Harry G. Davis
Director of Research and Statistics, Farm Equipment Institute

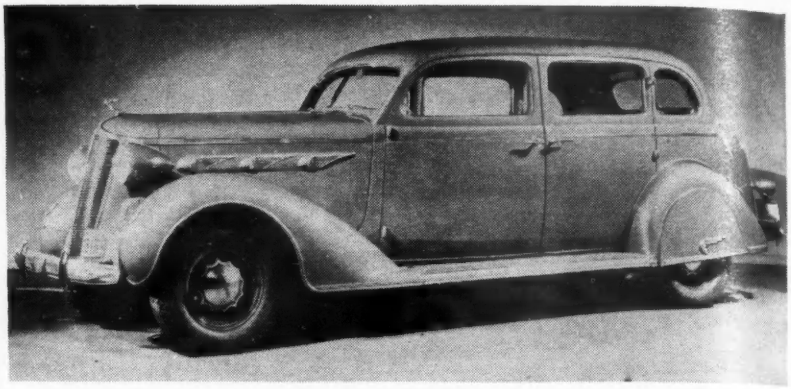
"The farmer market is about to undergo a drastic change in its credit relations," says Mr. Davis. "On the findings of the true facts as to farm incomes it is entirely possible that such industries as the automobile, truck, tractor and other automotive power manufacturers, which have a large part of their production absorbed by the farmer market, may be called on to revamp their system of sales and credits to farmers."

Heretofore, automobile, truck and tractor manufacturers have sold the farmer market largely on the basis of a down-payment and notes payable in the latter part of the year. These notes have been discounted with bankers or have been used as collateral to cover loans. Many factory distributor branches have followed this procedure on the old supposition of once-a-year incomes. Many franchised dealers have also followed this practice.

Mr. Davis' survey reveals that farm incomes—as based on all sales of stocks and crops for all farmers—is consistent throughout the year. For one leading middle western farming state, the average monthly income for the five-year period of the survey is shown to be 8.25 per cent. A city worker dependent on a salary, has a monthly income of 8.3 per cent, a difference of only 0.05 per cent per month. The high peak for the state in question, again as reckoned on the five-year average, was 9.1 per cent and the low month was 7.4 per cent.

Nearly all of the states throughout the corn belt show substantially the same monthly average income. Too, with the possible lone exception of the fruit-growing areas where crops are confined to one crop a year, practically the same ratio is maintained.

Mr. Davis' report is to be made public soon and, from opinions expressed by concerns which have studied the preliminary findings, there is a likelihood that many truck and tractor concerns will revise their farm credit procedure along somewhat the same lines as govern automobile finance plans.



De Soto has introduced a seven-passenger custom Airstream sedan on a 130-in. wheelbase chassis. It has two auxiliary seats which fold against the back of the front seat when not in use.

High Clearance Wheels Available on Chevrolets

New Standard models equipped with 19-in. wheels, two inches larger in diameter than the regular wheels, have been made available to purchasers by Chevrolet Motor Co. to provide extra road clearance for cars to be used largely on unimproved highways. The extra clearance is in demand by such users as rural mail carriers, owners of farms located off main highways, sheriffs and deputies in undeveloped regions, and others whose duties require them to traverse unimproved roads.

January Production Is Lower, But 25% Ahead of January '35

January production of passenger cars and trucks in the United States and Canada, totaling 380,554 units, fell off slightly from the previous month's total but topped the January, 1935, figure by 25 per cent. The gain is the more interesting when considered from the viewpoint that January was the first month in which new model production could be compared.

Though passenger car production was 13 per cent below the preceding month, truck production continued to rise, topping the December figure by 3771 units and the January 1935 figure by 3577 units.

Production in Canada totaled 13,302 motor vehicles, of which 7167 passenger cars and 1053 trucks were intended for sale in Canada. According to customs figures, Canadian exports for the month totaled 6622 units, compared with 1598 in January, 1935, while imports amounted to 451 units, compared with 264 a year ago.

Car and Truck Production—U.S. and Canada

	Jan., 1936	Dec., 1935	Jan., 1935
Passenger Cars—U. S. and Canada:			
Domestic Market—U. S.	280,968	322,096	210,806
Foreign Market—U. S.	18,958	22,517	18,427
Canada	11,261	11,370	8,269
Total	311,187	355,983	237,502
Trucks—U. S. and Canada:			
Domestic Market—U. S.	54,631	48,885	53,142
Foreign Market—U. S.	12,695	14,306	10,410
Canada	2,041	2,405	2,338
Total	69,367	65,596	65,890
Total—Domestic Market—U. S.	335,599	370,981	263,948
Total—Foreign Market—U. S.	31,653	36,823	28,837
Total—Canada	13,302	13,775	10,607
Total Cars and Trucks—U. S. and Canada	380,554	421,579	303,392

Best Year for Tractors Ahead; Farmers Demand Cheaper Power

In line with increased sales of automobiles and trucks for this year, tractor manufacturers are preparing for the biggest year in their history. It is estimated that 1936 production of tractors will be considerably in excess of 300,000 units, of which over 100,000 are expected to be diverted to the farm market to replace worn-out equipment.

Surveys which are being made by the Farm Equipment Institute indicate that on Jan. 1 there were approximately 1,250,000 tractors in use on farms throughout the country. Ten years ago there were but slightly more than 500,000 tractor units on the farms.

The tractor industry points to three factors as vital contributors for the anticipated rise in demand this year. As the first factor, replacements are demanding an increasing number of units each year. The second is that there is a natural shortage of power on the farms, and with most horse stocks past the breeding age it has become cheaper to buy power than to raise it.

The third factor, and one on which the industry pins great faith, is found in the "One-Plough" unit, recently brought out, which is so small and inexpensive that many farmers who have previously felt they could not afford tractors are now buying them. Its wide acceptance is assured.

Surveys which have been compiled by both the Farm Equipment Institute and individual manufacturers show that tractors on farms are used an average of 100 days in the year. The minimum number of days which they can be used and still furnish economical power is estimated as 60 days.

The farm market in the past has absorbed approximately 65 per cent of the industry's production. Only about 15 to 18 per cent are put to industrial uses. Recent years have found an increasing demand for tractor power in the several branches of the construction trades.

Local Truckers Want Their Status Defined

Local cartage haulers last week formed a new national association, the National Local Truckers Associations, Inc., to take the place of the old National Team and Truck Owners' Association. The group will establish headquarters in Washington.

Pertinent among the matters discussed at the organization meeting which was held in Cleveland was the status of local cartage concerns under the 1935 Motor Carrier Act. No definite ruling has as yet been given as to their status.

The group adopted a resolution asking the Interstate Commerce Commission to hand down such a ruling, and to give cartage concerns a grouping apart from highway and long distance haulers. The petition sets forth that the problems of cartage haulers are different from those of highway operators.

GM Pays $11,000,000 To Thrifty Employees

More than $11,000,000 in cash and General Motors common stock has been distributed to about 25,000 General Motors employees in the annual disbursement under General Motors Corporation's Employees' Savings and Investment Plan, according to an announcement this week by Alfred P. Sloan, Jr., president. The sum represents payments to members of the 1930 saving class which matured at the end of 1935.

Of the $11,000,000 total, $4,800,000 represented savings paid in by the employees during 1930, while the balance of $6,200,000 represented accumulated interest plus General Motors common stock contributed by the corporation under the plan.

Each employee who saved $300 in 1930, the maximum allowed under the plan received in the present settlement his original $300 plus interest payment of $112, plus 4.9 shares of General Motors common stock valued (as of Dec. 31, 1935) at $279—a total of $691, or more than twice his original investment.

The average amount paid this year per employee participating was $438 and the total was the second largest in the past eleven years.

Canadian Motor Vehicle Sales Rose 60% in Jan.

January sales in Canada of new motor vehicles were 5544 units of which 4730 were passenger cars and 814 trucks and buses. The total represented an increase of almost 60 per cent over the 3472 cars, trucks and buses sold in January, 1935, and an advance of 160 per cent over the 2131 sold in January, 1934. Truck and bus sales increased as compared with January, 1935, by 32.4 per cent in number and 18.2 per cent in value. In January this year 814 trucks and buses retailed at $804,564.

Graham Spent Half-Million On Tools for Supercharger

Graham-Paige Motors Corp. has expended $500,000 in new tools to facilitate production of the new Graham Supercharger, Joseph B. Graham, president, announced last week. The company's change-over from 8-cylinder to higher-powered, more compact engines of the 6-cylinder type necessitated the new tooling and has paved the way, Mr. Graham said, for enlarged production at lower cost to the company and to the consumer.

Wheels for War

Globe photo

The Old Salutes the New

First of the regiments to be completely mechanized in the vast program initiated by the British Army, is the Third King's Own Hussars. The new fighting unit of the "cavalry" will be the armored car shown above. It will carry a driver, a non-commissioned officer, and six troopers. This fighting car can negotiate rough ground like a tank but is lighter and much faster.

Each battalion of the new British "cavalry" will comprise three troops of machine-gunners and one of anti-aircraft artillery. The tank corps—a heavier "cavalry"—will be expanded to more than 200 mobile forts of various types. Light artillery will be speeded in its movements from 3½ to 8 m.p.h. when the tractor will have replaced the horse.

Even the infantry will be abolished. Of the four companies forming a battalion, three will ride on machine-gun carriages and the fourth in tanks. Officers will be borne in Baby Austins, and couriers will be mounted on motorcycles.

Earnings Statements of Automotive Companies

Vehicle Manufacturers	1935	1934
Hudson Motor Car Co	†500,000	*3,239,201
Mack Trucks, Inc.	*395,616	17,133
Seagrave Corp. and Seagrave Fire Engines, Ltd	*525	*90,727
Yellow Truck & Coach Mfg. Co	503,000	*886,468
Other Automotive Companies		
Briggs & Stratton Corp	1,063,324	540,498
Campbell, Wyant & Cannon Foundry Co	654,002	*17,414
Chicago Rivet & Machine Co	232,624	98,198
Defiance Spark Plug Co	*369,917	*61,179
Detroit Gasket and Mfg. Co	463,151	86,838
Evans Products Co.	329,502	1,328,840
Gemmer Mfg. Co.	220,214	*13,047
Muskegon Motor Specialties Co	55,535	107,716
Reynolds Spring Co.	394,839	150,637
Watson (John Warren) Co	*112,306	*302,385
Western Auto Supply Co	867,396	1,411,384
Oil Companies		
Houston Oil Co. and Houston Pipe Line Co	846,790	281,146
Kirby Petroleum Co	146,493	134,629

*—Loss. †—Estimated.

Graham-Paige Decides to Drop Its Sales Branches

Graham-Paige Motors Corp. has revised its retail distribution policy to restore the independent distributor to his old place in the industry, by abandoning the branches which the company established in 1928 and which have been found to be less profitable from the company's standpoint than distribution of Graham-Paige cars through independent distributors. Joseph B. Graham, president, said the company would effect a substantial saving this year as a result of this change in sales policy.

"We feel that the most promising future for the automobile industry as a whole lies in a closer relationship between the manufacturer and the independent dealer," Mr. Graham said.

Simpson Outlines Pontiac's Dealer Organization Policies

(*Continued from page 325*)

and keep him if we disregard his equities and crowd him with too many other dealers. That is a most discouraging thing to reputable high-quality representation.

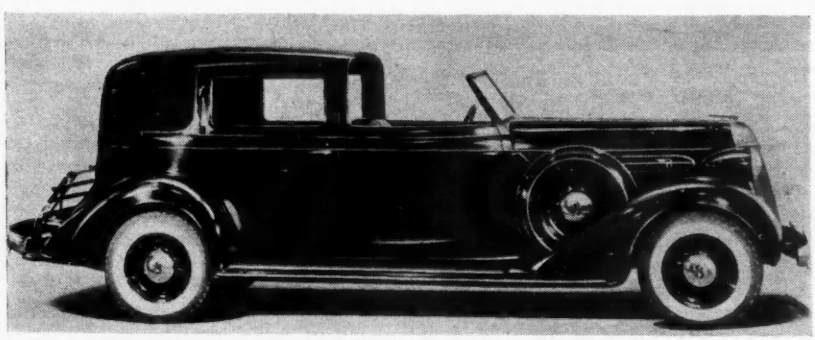
"We can interest the kind of a dealer I refer to only by being interested in whether or not our dealers are making a profitable return on their operation. We desire to help them, and here again the reputable dealer is the easiest to help because he is the most intelligent. It is an axiom that good service helps sell many cars. Our policy is to help dealers become service-minded. You can't make much headway talking up-to-date service operation to a curbstoner, but you can to a substantial dealer.

New By-Products Recovery Equipment for Rouge Plant

New by-products recovery equipment for the coke ovens department of the Ford Rouge Plant which will provide improved and more economical methods of recovery is being installed at a cost of $500,000, it was announced today by the Ford Motor Co.

The installations, which will be used to treat gas from two new batteries of coke ovens which are being constructed and from an older battery which is being retained, are included in a $4,000,000 coke ovens construction program which will materially increase output of fuel gas for plant consumption at the Rouge.

Included in the equipment to be installed are three new primary coolers, two sets of elevated decanters constructed to allow daily removal of pitch deposits, two new liquor flushing pumps and two new liquor circulating pumps. Revisions will be made to accommodate the patented Ufer process for treating light oils in the benzol washers, and present units used for treating ammonia-containing liquors to procure free ammonia will be dispensed with, effecting a saving.



A town car has been added to the Chrysler 1936 line. Built on the 133-in. DeLuxe Eight chassis, the driver's seat may be entirely enclosed by a detachable canopy.

Goodyear Officials Remain "Prisoners"

Strikers Block Factory Entrances; McGrady Takes Charge of Negotiations

Edward F. McGrady, assistant U. S. Secretary of Labor, arrived in Akron from Washington by airplane Wednesday, Feb. 26, in an effort to end the Goodyear strike which has paralyzed production and produced a complete blockade of the Goodyear factories for 10 days. McGrady immediately went into conference with P. W. Chappell and E. C. McDonald, labor department conciliators.

On the strength of a proclamation by Herman E. Werner, Summit County prosecutor, that the Goodyear plant would remain closed until Goodyear officials negotiated the grievance with striking employees, the number of pickets was reduced to six at each of the 44 main factory gates and entrances. Paul Litchfield, president of Goodyear, who has been "imprisoned" for 10 days in the barricaded plant, in a radio address Tuesday night from the factory reiterated the company's refusal to meet with strikers and picketers as long as the plant was barricaded, but also stated a willingness to meet with citizens' groups and non-strikers. He charged that law enforcement had broken down and said the company would not deal with the law-defying group picketing the plant.

"I cannot be a party to any recognition of the theory that governmental stability has collapsed and that the seat of constitutional authority has been forcibly moved from the city hall and courthouse to the center of the mob that mills before our gates," Litchfield said over the radio.

Factories of the Goodyear Tire & Rubber Co. at Akron, Ohio, continued to be closed and blockaded by hundreds of pickets, despite the issuance by six Summit County common pleas judges of an order restraining the striking employees from continuing their mass picketing and from interfering with employees who wanted to enter the factory to resume work. The injunction became effective Monday morning, Feb. 24. Injunction notices posted in the strike zone by Sheriff James T. Flower were pulled down and trampled under foot as the pickets, carrying American flags, and armed with clubs, lengths of hose and ten-pins from bowling alleys, formed a solid phalanx across all of the factory gates and entrances and defied the injunction order. Appeals were

Studebaker makes a record in Los Angeles. Ground was broken for the Pacific Studebaker plant early last September and since then the plant was built, machinery installed, and 2100 cars completed.

made to Governor Martin L. Davey at Columbus for state troops but state military observers sent to Akron by the Governor declared troops would not be sent unless major disorders should develop.

Monday, Feb. 24, Goodyear directors met at the Mayflower Hotel and declared the usual $1 per share preferred stock dividend payable April 1 to stock of record March 20. President Litchfield, barricaded in the plant, participated in the meeting by telephone.

Officials of the rubber unions have declared that the appearance in Akron of state troops would preciptiate a general strike of all rubber workers in the city. A citizens' committee of 127 business leaders headed by the Rev. J. P. Hendershot has been organized and is endeavoring to bring about a peaceful settlement of the strike.

Sun Oil Taxes Larger Than Profit in 14-Year Period

An interesting survey of oil taxation accompanied the annual report of the Sun Oil Co., made public last week by J. Howard Pew, president of the company. During the past 14 years, the survey stated, the Sun Oil Co. has collected and paid to public treasuries $118, 013,531 in taxes while net income for the same period totaled $63,788,-744.

For 1935 the company's net income was $7,100,238 compared with $6,650,-464 in the previous year.

Teetor and Warner Plan Visit to Coast Sections

Ralph R. Teetor, in charge of engineering, Perfect Circle Co., and president of the Society of Automotive Engineers, and John A. C. Warner, general manager of the S.A.E., will visit the Pacific Coast next month.

Mr. Teetor will speak on "Keeping the Automotive Industry Young" at meetings of the Northwest Section at Seattle, March 24, the Oregon Section at Portland, March 26 and the northern California Section at San Francisco, March 31. Mr. Warner will also speak at these meetings.

Raybestos-Manhattan, Inc., has declared a quarterly dividend of 37½ cents a share. In the previous quarter 25 cents a share was paid, but was not designated as quarterly.

AAA to Check Stock Car Race at Daytona

Ten American Makes Are Entered in First Annual Beach and Road Classic

The first annual 250-mile stock car beach and road race classic under the official supervision of the contest board of the American Automobile Association has been scheduled for March 8 at Daytona Beach, Fla. Provisions of the race call for strictly stock car specifications and provision has been made for every size and price class of American automobiles. A handicap system, worked out to the decimal, will balance advantages in engine sizes.

Twenty-four cars have been entered to date and include Auburn, Buick, Chevrolet, DeSoto, Dodge, Ford, Hudson, Pontiac, Studebaker and Terraplane. Such names as Major Gardner of London, Doc Mackenzie, Bob Sall and Ben Shaw are in the line-up.

The race will have a guaranteed minimum purse of $5,000 and will be run over a three and one-fifth-mile course including Daytona's famous measured mile and a part of the highway which flanks the beach.

This event not only marks the beginning of an annual series, but is the first stock car race under the A.A.A. Contest Board's control since 1934. In that year two races were held at Los Angeles and one at Oakland. In 1933 a race was held in Elgin, Ill. No such events were held in 1932 or 1931. In each of the four events mentioned all five placed were taken by Ford V-8 cars, and in the line-up this year 13 Fords are registered.

Hercules Licenses British Firm to Make Light Diesel

It was announced in New York this week that Hercules Motor Corp. had entered into an agreement with Ruston Hornsby, Ltd. of Lincoln, England, under which the latter concern will manufacture the Hercules line of light, high-speed Diesel engines abroad.

"Design Car Bodies for Comfort"—St. Gaudens

Worship of the streamline fetish has not only made automobiles more uncomfortable in the last five years, but has achieved only "alleged good looks" in the process, according to Homer Saint-Gaudens, director of fine arts, Carnegie Institute, Pittsburgh.

"To sail through the air with the greatest of ease" is only one function on an automobile, this recognized authority on art told the Pittsburgh Section of the S.A.E. recently. Designers next year ought to ruminate a bit on the London taxicab, the Baltimore & Ohio locomotive or the Empire State Building and then apply to their 1937 cars some of the lessons learned.

Here is the way it ought to be done, according to Saint-Gaudens:

Build a dummy car satisfying the requirements of the particular type of vehicle. Place dummy passengers in the seats. Then permit the designer of the body contours to modify the resulting form, "yet always in the manner that has most to do with the comfort of the passengers and the functioning of the machinery and least to do with latter-day slippery excrescences."

"I believe that the automobile would be much better looking if its design were confined to expressing the automobile's function. . . . Often while riding I wish to look about me without sliding down on my collar button or seeing only the gutter. I object to ruining a new Fedora getting out of the contraption. Being 55, I am distressingly conscious of my waistline as I squeeze into the seat. . . "

Business in Brief

Written by the Guaranty Trust Co., New York, exclusively for AUTOMOTIVE INDUSTRIES

A further gain in general business was made last week despite unfavorable weather in some sections of the country. Carloadings, coal production, and steel output were higher. Engineering contracts awarded were four times the volume of those in the corresponding week last year.

Guaranty Trust Index

The Guaranty Trust Company's index of business activity for January stood at 77.7, as against 82.1 for December and 71.7 a year ago. The company's index of wholesale commodity prices on Feb. 15 was 53.7, as compared with 53.9 a month earlier and 53.1 a year earlier.

Carloadings Continue to Rise

Railway freight loadings during the week ended Feb. 15 amounted to 631,347 cars, which marks an increase of 9250 cars above those in the preceding week, a rise of 49,678 cars above those a year ago, and an increase of 31,079 cars above those two years ago.

Food Prices Lower

During the two weeks ended Jan. 28 retail food costs declined 1.2 per cent. The current index stands at 80.7, as against 81.7 two weeks earlier and 78.9 a year ago.

Chain Store Sales Rising

Sales of 28 store chains, including two mail order houses, in January were about 8 per cent above those in the corresponding period last year. Sales of the two mail order houses alone increased 11.7 per cent.

Electric Output Stable

Production of electricity by the electric light and power industry in the United States during the week ended Feb. 15 was slightly below that in the preceding week, but was 10.8 per cent above that in the corresponding period last year.

Lumber Shipments Decline

Lumber production during the week ended Feb. 8 stood at 51 per cent of the weekly average for 1929. Shipments declined below those in the preceding week by 18 per cent, while new business was 4 per cent smaller and production fell by 2 per cent.

Fisher's Index

Professor Fisher's index of wholesale commodity prices during the week ended Feb. 22 stood at 83.8, as against 83.4 the week before and 83.5 two weeks before.

Federal Reserve Statement

The consolidated statement of the Federal Reserve banks for the week ended Feb. 19 showed a decline of $1,000,000 in holdings of discounted bills. Holdings of bills bought in the open market and of government securities remained unchanged. Money in circulation increased $8,000,000, and the monetary gold stock rose by $5,000,000.

Insurance Companies Urge Banks Finance Car Sales

Announcement that the London Assurance and associated fire insurance companies have advised agents to seek automobile insurance in connection with time financing of automobile sales by local banks is taken as a further and important step in the drive to take part of the profitable installment sales business away from the established finance companies. The finance companies state, on the other hand, that independent bank financing of automobiles has diminished.

There are as yet no complete figures on the number of banks that have gone into automobile financing, although efforts have been made through the American Bankers Association to get them. The London companies take the position that so long as the financing is done locally instead of through national financing organizations, they will secure their share of the business.

A greater degree of flexibility is said to be secured than with national company plans. Bank rates for "character loans" of the type involved vary with the banks, but Walter Meiss, executive general agent of the companies, commented that banks can afford to do the business at a lower rate than can the finance companies. An offsetting feature is the loss for the automobile dealer of the "kickback" from the finance companies, since the arrangement results in the dealer receiving cash for his car, with the loan made directly through the local bank. This payment to dealers is 2 per cent on the first $500 by Universal Credit and 1½ per cent by other major companies. The dealer, of course, is relieved of indorsements on the paper.

Banks in Chicago, St. Louis, Kansas City, Detroit, New Orleans, and the Bank of America on the Pacific Coast are among those offering plans.

The insurance companies are taking advantage of every attack made on the established system to point out the strong points of the localized business. Here and there, states have ruled that master insurance policies on automobiles bought on time are illegal and that complete policies must be given. In Ohio efforts have been made to require any person handling automobile insurance to be a registered agent. This would rule out automobile dealers, as one part of the proposed Ohio regulation would require insurance men to spend their entire time at that work.

Representatives of large finance companies inform AUTOMOTIVE INDUSTRIES that the amount of business lost to local banks and insurers has declined since the introduction of the "6 per cent plans." It is admitted in some quarters that local bank plans were one reason for the adoption of the 6 per cent arrangement.

What will be the result if any of the major banks go into it is not predictable as yet. Experience with loans of the FHA type would seem to indicate that small character loans are not productive of much business in the aggregate. Finance companies state that banks find the business unprofitable for lack of experience and equipment, and remark also that automobile dealers can more frequently clinch sales by producing standard time financing contracts "at the psychological moment" than by seeking to arrange the sale through a local bank with the consequent interviews and discussions.

The London assurance and associated fire insurance companies announce that their agents have been advised to seek automobile insurance business through contact with the banks entering the field of motor vehicle financing. It was stated that a large number of banks are now considering entrance into the field.

"In the last few months scores of commercial banks that we know of have entered automobile financing for the first time," Walter Meiss, executive general agent of the companies said in announcing the details of the new plan. "The nationwide interest in the subject has amazed me. In by far the majority of cases the insurance is going to local agents. Hundreds and hundreds of banks, both large and small, are now seriously considering going into this profitable field because they have found that the methods are simple and that installment financing of automobile purchases is a logical, lucrative outlet for the surplus funds of commercial banks.

"In the past two months more than 5000 of our booklets, 'A Profitable Thought, Mr. Banker,' have been requested by bankers, and by agents for their bankers. The problems involved in giving adequate, economical, and satisfactory insurance coverage to both the financing institution and the automobile buyer are finally solved by this new plan. In many cases the premiums for property damage and bodily injury are included in the amount of the loan, together with the fire and theft, or comprehensive, and collision premiums so that the agent is paid immediately and the bank makes a somewhat larger and more profitable, and equally desirable loan."

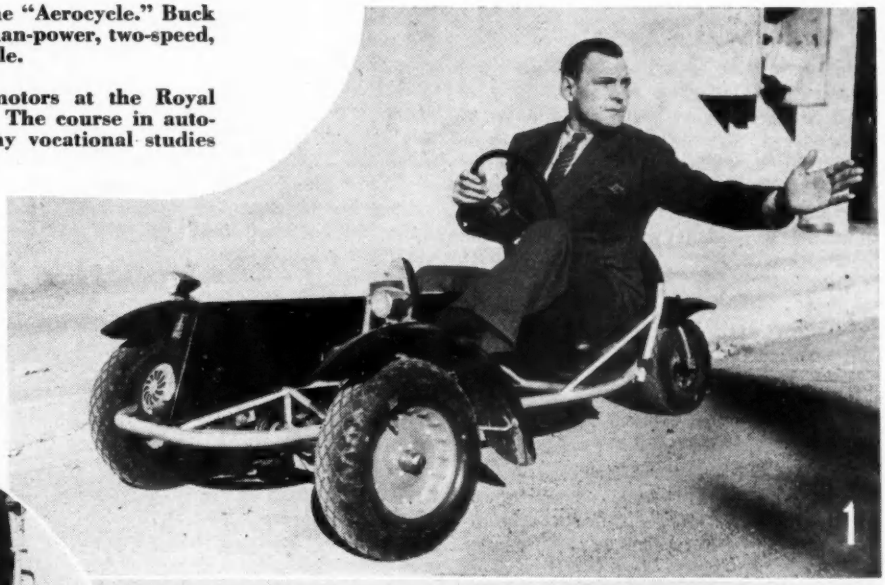
The WORLD on WHEELS

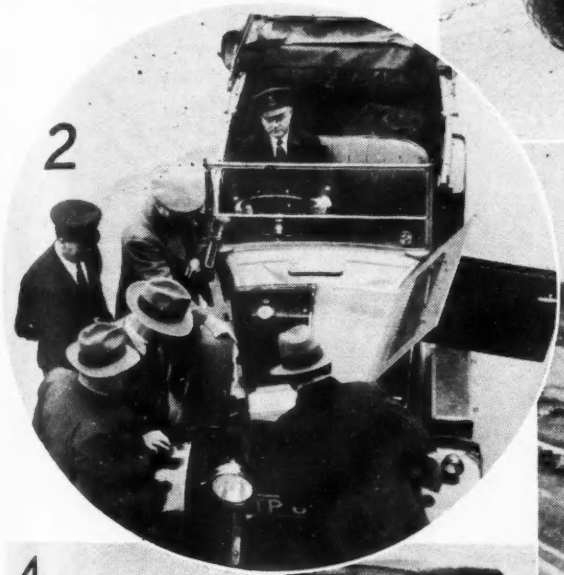
1. Hollywood filmfolk are mad about the "Aerocycle." Buck Jones is said to do 20 m.p.h. on his one-man-power, two-speed, front-wheel drive vehicle.

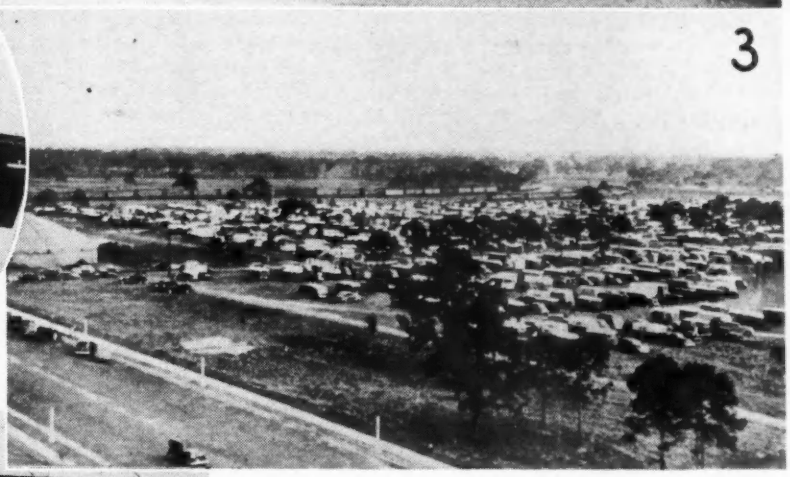
2. Retiring British Navy men study motors at the Royal Navy School of Motoring at Portsmouth. The course in automobiles is the most popular of the many vocational studies offered.

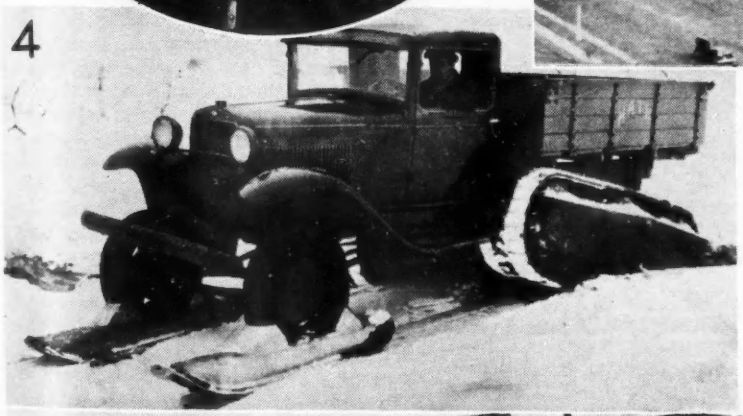
3. More than 1200 trailers house 3000 tourists at the Sarasota, Fla., municipal camp where the 16th annual "Tin Can Tourist" world convention is being held.

4. Russians have built a "Go-Everywhere" truck for winter use on the Siberian steppes.



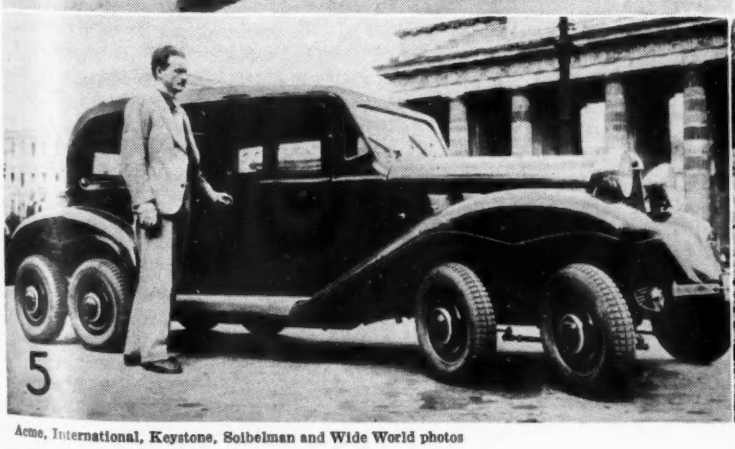






5. Gotthard Rimek, a Berlin engineer, thinks his new car is an improvement on the ordinary four-wheeled vehicle.

6. A steel cage rumble seat provides safe transportation for convicts on their way to the Oklahoma State penitentiary at McAlester.



Acme, International, Keystone, Soibelman and Wide World photos

Sales Rising With Warmer Weather

(Continued from page 325)

number of unfilled orders that have not been reported to the factories. Buyers have delayed taking delivery on account of bad weather and dealers hesitate to report such orders for fear of being asked by the factory to take more cars. Obviously they are reluctant to add to their stocks unless weather conditions permit moving them. Hence the amount of business in the offing is believed to be considerably greater than indicated by dealer reports. The cumulative effect of such business, the deferred buying of recent weeks and the normal spring bulge is expected to bring intense activity to the industry very shortly.

Retail sales increased during the second 10 days of February. Despite unfavorable conditions, six leading companies showing a gain of approximately 10 per cent over the first 10 days. Unless the sales pick-up is nipped in the bud by bad weather again, it is felt that February stands a good chance of finishing moderately well ahead of February last year. The month was still in the lead at the end of the second 10 days, according to available figures, although losing ground in the latter reporting period. However, the final 10 days were expected to restore a more favorable margin over corresponding month last year.

Some veterans' bonus business has started coming into the market and dealers are attempting to advance this class of buying by offering more liberal finance terms. Since the bonus money is not expected to be paid until July, dealers are making cars immediately available to preferred risks by means of the so-called "balloon note." Under this plan, a prospective bonus recipient who has a job and is regarded a good risk can make a down-payment somewhat less than the customary one-third, make small monthly payments and take the entire balance of the note when the bonus is paid. In every case, the note is guaranteed by the dealer. Finance companies have had a number of requests from dealers for some plan to handle this business, but are leaving arrangements entirely to the dealers, and are handling the business as they would any special deal requiring dealer endorsement of the paper.

The Government has ruled that no lien can be created against bonus money and since they are contingently liable on the customers' note, dealers realize that extreme caution must be exercised in selection of risks.

A. W. L. GILPIN, a veteran of the automobile industry for the past 30 years, and until recently general sales manager of Pontiac Motor Co., has resigned on account of ill health.

C. P. SIMPSON has been appointed general sales manager of the Pontiac Motor Co. Mr. Simpson has been assistant sales manager in charge of the West since 1933. He began work with General Motors in 1922 as representative for another division of the company in the Los Angeles region, becoming zone manager the following year. He later managed the El Paso and Houston zones, and returned to Los Angeles in 1933.

R. W. RUDDON, vice-president and general manager of Federal Motor Truck Co. is recovering at home from an appendectomy performed in Providence Hospital, Detroit, Monday, Feb. 17 when he was taken suddenly ill.

A. N. BENSON, formerly manager of the Minnesota Dealers Association, has joined the headquarters staff of the National Automobile Dealers Association.

CLIFFORD W. SORENSON, president of the Continental Die Casting Corp., of Detroit, and Mrs. Irene McL. McGrane were married last week at the Sorenson home in Miami, Fla. Mrs. McGrane is secretary of the Continental Die Casting Corp., and was Mr. Sorenson's personal secretary. Mr. Sorenson is a son of Charles E. Sorenson, of the Ford Motor Co.

ALEX TAUB, Chevrolet engine specialist, left for England on Feb. 26 for a two months' stay. Mr. Taub will confer with European engineers of General Motors Corp., and will spend some time at the Vauxhall plant.

CARL M. WISE, formerly with the Marshall Asbestos Corp., has been made assistant director of automotive engineering of the Bendix Products Corp., with headquarters in South Bend.

JOHN W. WHITE has joined the Bendix Products Corp., and has been assigned to special work on hydraulic steering, brakes and controls. He was formerly engaged in designing brakes and brake equipment.

HOMER H. KUNKLER, formerly with the General Household Utilities Co., has been appointed assistant to F. A. Hiter, vice-president and general sales manager of the Stewart-Warner Corp.

HENRY B. CLAPP has joined the staff of the Clark Tructractor Co., Battle Creek, Mich., as transportation engineer. Mr. Clapp is a graduate of the Colorado School of Mines and has wide experience in production, cost analysis and elimination of unproductive labor in manufacturing plants.

CHARLES J. GASKELL has been appointed Memphis, Tenn., representative of the Modine Manufacturing Co., of Racine, Wis. Mr. Gaskell's office will be in the Falls Building and his territory will cover the western part of Tennessee, the eastern part of Arkansas and the northern part of Mississippi.

Barit Confirmed As Hudson Head

(Continued from page 325)

mobile industry to men of talent and vision.

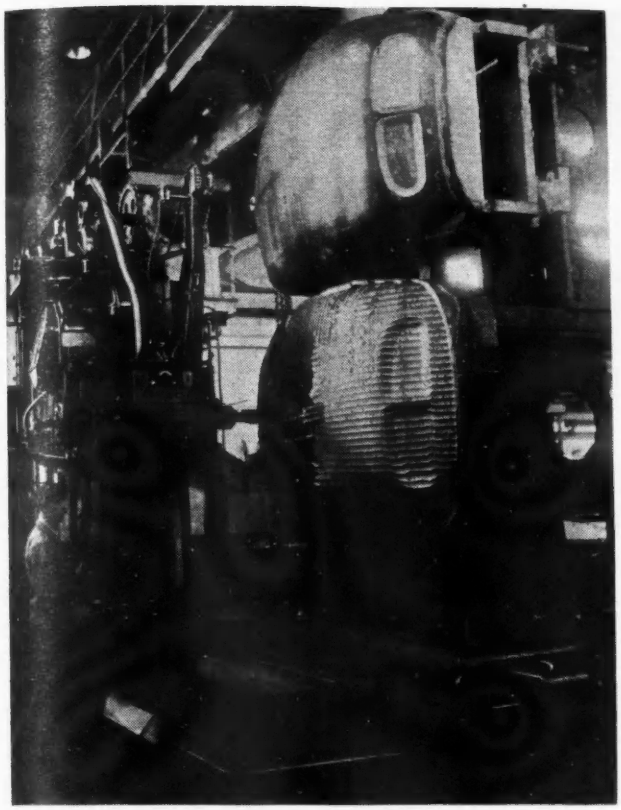
When the Hudson Motor Car Co. was organized in 1909, Mr. Barit was employed as secretary to the purchasing agent. His career with the company took him successively through the positions of assistant purchasing agent, purchasing agent, and then as one of the officers of the company. Through this period of constant contact with suppliers in the ever shifting condition of this fast moving industry, he showed a keen aptitude for management and finance, and as a result received the appointment of treasurer. In recognition of his valuable services on the board of the company, he was elevated to the position of first vice-president and treasurer to which, in line with Mr. Chapin's policy of surrounding himself with a strong executive organization, was later added the title of general manager.

It was in this capacity that he worked side by side with Roy D. Chapin during recent years, in which the forward strides made by the company have made history in the automobile industry. Finance, manufacture, sales engineering and purchasing have been under his jurisdiction. He is known among his associates as a keen, logical thinker with a remarkable fund of information. Speaking of Mr. Barit to an associate just shortly before his death, Mr. Chapin stated: "He has a more thorough knowledge of every angle of the automobile business than any man I ever knew."

His appointment to succeed Mr. Chapin was a foregone conclusion. Supporting Mr. Barit in the management of the company will be S. G. Baits, assistant general manager, and the same organization of officers and executives who with Mr. Chapin have brought Hudson to its present high standing in the industry. Because of this, and because of the fact that Mr. Barit's influence in the management of the company has been so keenly felt during recent years, little or no change in the basic policies of the company is expected.

Others elected by the board include Stuart G. Baits, first vice-president and assistant general manager; W. R. Tracy, vice-president in charge of sales; I. B. Swegles, vice-president in charge of manufacturing; C. A. Oostdyk, vice-president in charge of purchases; A. Hood, treasurer; C. D. Sterling, secretary; and E. Cody, assistant secretary.

In addition to the above officers, H. M. Northrup, chief engineer of the



Cutting the die for Hudson's solid steel top taxes the capacity of the biggest standard Keller die-cutting machine made. Above is the mahogany master top which the guiding finger follows in order to direct the cutter at work on the die below. Twelve thousand man hours were required to cut this die. It is of nickel-chromium iron with alloy steel inserts at all wearing parts, and is equipped with oil wells at necessary points in order to permit continuous work on the press. The die is first rough-cut, leaving a corrugated surface as can be seen at the front end, and then finish-cut, as on the rear.

company, was elected a director. The board of directors now consists of the following: A. E. Barit, S. G. Baits, A. Hood, C. A. Oostdyk, C. B. Sterling, W. R. Tracy, I. B. Swegles and H. M. Northrup.

Hudson Out of Red

Hudson Motor Car Co.'s earnings for 1935 will exceed $500,000 after all charges and taxes are paid, according to preliminary figures announced by A. Edward Barit, president.

Ford Improves Gas System

(Continued from page 325)

peak loads and will serve as a standby supply. The station is able to provide about 30,000,000 cu. ft. of mixed propane and blast furnace gas, when occasion demands. Six propane tanks, with a capacity of 30,000 gal. each, have been installed. The propane (liquefied hydrocarbon) is kept under pressure. When required, it is forced into vaporizers, yielding 900,000 cu. ft. of propane gas per tank, or a total of 5,400,000 cu. ft. from the six tanks.

This gas, having a heat value of 2500 B.t.u. to the cu. ft., is mixed with blast furnace gas with a heat value of 100 B.t.u. per cu. ft. at a 1 to 5 ratio, resulting in a gas with a heat value of about 500 B.t.u. per cu. ft. The propane mixing station houses six or eight vaporizers which change the liquefied hydrocarbon to the gaseous form, a machine for mixing propane gas and blast furnace gas or for mixing propane gas and air, when blast furnace gas is not available.

W.-O. Receivership Ends

(Continued from page 325)

of the plant, while still under jurisdiction of Federal Court, will be free from the necessity of specific court orders. About 410 workers are now employed, mostly in the forge shop, preparing for production of 6600 units of a 15,000 car order authorized by the court. New cars will not be off the line until about April 1, and it is believed a reorganization plan will be presented to the court before that date.

Empire Securities, Inc., of which Ward M. Canady is president, has obtained offers of at least 67 per cent of bonds, it is understood, and will close purchase of them in New York before the end of this week. About 90 per cent of creditor claims are offered at 25 cents on the dollar to Empire. It is believed the Securities Company has the backing of the Willys family, which is a large holder of preferred stock.

U. S. Air Exports Drop 22% in '35

China Continued in First Place; Italy's Purchases 37 Times Higher Than '33

United States exports of all aeronautical commodities totaled $14,330,843 last year compared with $17,548,181 in 1934 and $9,155,882 in 1933, according to the Bureau of Foreign and Domestic Commerce, Department of Commerce. Sales of aircraft totaled $6,638,515, while sales of aircraft engines accounted for $2,459,317 and parts and accessories, $5,233,011.

Exports to China, valued at $2,522,538 led those to all other nations for the second consecutive year, yet declined sharply from the previous year's total of $3,778,262. Sales to the Netherlands and Russia occupied second and third place respectively, while sales to Italy increased from $21,003 in 1933 to $107,245 in 1934 and $789,826 in 1935.

Italy's purchases from the United States last year included only three complete planes valued at a total of $14,552, but led all other countries in value of aircraft engines. Italy's 63 engines cost $549,310, contrast sharply with China's 80 which were valued at only $264,693.

Total exports to Germany, ranking fourth in 1934 and valued that year at $1,761,607, dropped to 19th place in 1935 and were valued at $195,464. Only seven engines were purchased in 1935 compared with 213 the previous year.

Russia, though third in total sales for 1935, purchased only 21 engines last year compared with 405 in 1934. Russia's purchases of aircraft parts and accessories in 1935 were the highest of all countries, amounting to $720,301.

Joseph A. Anglada has resumed practice as consulting engineer after having completed research work on which he had been engaged. Mr. Anglada's office is at 11 Park Place, New York, with associate office at 1235 LaFayette Building, Detroit.

40 Years Ago

with the ancestors of Automotive Industries

Some motor inventors seem to be building vehicles to meet extraordinary conditions, or accidents, rather than for ordinary use. A motor vehicle for light pleasure purposes need not be a battering-ram. It is not advisable to keep ever in mind possible collision with other vehicles or objects still more solid, for by so doing we lessen the practical value of the vehicle.

The bicycle is a very light and comparatively frail machine. When it comes into collision with a heavy wagon, a fence, or other obstruction, it is generally badly wrecked, yet no manufacturer of bicycles would think of trebling the weight of his machines on this account. . . . But this is exactly what some builders of motor vehicles are doing. The extraordinary accident fills their minds and the ordinary conditions are forgotten. Build for ordinary conditions and let the extraordinary take care of themselves.—From *The Horseless Age*, February, 1896.

Delivers Buns Hot

Light-weight, stainless steel bakery delivery truck recently built by the Edward G. Budd Manufacturing Co. for a Philadelphia baking concern. The truck, first of a fleet, has a capacity of 280 pans of bakery products, a load of approximately five tons. Insulation of the body keeps the products hot until delivered to customers. The Autocar Co., Ardmore, Pa., built the chassis.

Big Mexican Roadbuilding Program Boosts Car Sales

With both 1934 and 1935 setting new records for the sale of automobiles in Mexico, the republic is in the midst of great developments in transportation, according to Jose Rivera, general manager of the Mexican Automobile Dealers' Association, who has been visiting in this country. This development is due to the national program of roadbuilding, sponsored by the Federal Government, and aided by the local projects of the 28 states.

"General improvement of conditions has also stimulated commerce and industry and made for an increased use of motor vehicles," said Mr. Rivera. "Automobiles are seen not only in the streets of the main cities but are moving into the country as a result of the new roads. The strangest thing about this rural development is that as soon as even a goat trail is improved, immediately buses and trucks are put into operation to replace the old burro pack trains."

While the ratio of cars to population is only one car to every 160 persons, traffic problems are nevertheless arising. The main thoroughfare in Mexico City, the Paseo de la Reforma, provides four lanes of traffic, but is insufficient during peak hours. Most of the smaller streets of the capital have been made into one-way streets to avoid congestion.

This year Mexico is building highways on a bigger scale than ever before. The Federal and state governments are to spend 36,000,000 pesos, approximately $10,000,000, in national and local road programs on a half-and-half sharing of expenses. The program will include completion of the international highway from Nuevo Laredo on the United States border to Mexico City, a road 762 miles long, passing through mountainous country at an altitude varying from 700 to 8335 ft. Work on the road from Nogales, opposite El Paso, Tex., to Suchiate on the Guatemalan border via Mexico City, a distance of 3536 miles, will also be advanced this year. Both of these roads are part of the Mexican division of the Inter-American Highway. When this road is completed, Mexico will have spent about 130,000,000 pesos ($32,500,000) on its sections of the highway.

Virtually all the money being spent on road-building is derived from the gasoline consumption tax. This levy yielded 10,814,234 pesos in 1935, and is expected to give almost double this amount during the current year.

DuBrul Speaks on Economic Trends to Detroit Meeting

S. M. DuBrul, in charge of special economic studies, financial department, of General Motors Corp., addressed The Detroit Engineering Society last week on the subject, "Where Are We Going." Mr. DuBrul's talk projected his audience into the trends in the political, sociological, and economic fields, illustrated by charts showing these trends.

Scrap Price Advance Merely Speculative

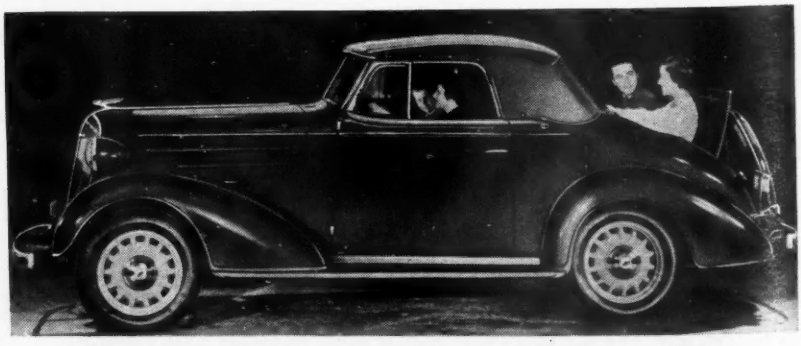
Finished Steel Market Not Affected by Bull Maneuvers in Scrap

In both the ferrous and non-ferrous metal markets, scrap prices, ordinarily a subordinate topic, came in for considerable attention this week. Automotive manufacturers are both consumers and producers of scrap, but it is seldom that scrap price levels exert any major influence on the market for finished steel products, the ups and downs of the latter usually determining the tone of the scrap market. Heavy melting steel scrap, the key description of major importance in the making of steel, is quoted $3 to $5 a ton higher than at this time a year ago, and in Pittsburgh scrap iron speculators are talking of $17 scrap, the highest level in five years.

Very little scrap has moved into steel mill consumption at these advanced prices, the rise having resulted solely from speculative maneuvers in the scrap iron market, with the "bulls" now applying a tight squeeze to those dealers who have sold short. Steel mill purchasing agents usually have the last say in such speculative battles, and temporarily higher quotations for scrap are no more likely to be accepted as a valid basis for higher prices to the buyer of finished steel than they have in the past.

In the copper market some interests have hit upon the idea that, inasmuch as a plethora of scrap has at times been responsible for declines in the market for refined metal, it would be a good stroke to reverse the process and raise the price of scrap as a means of elevating the copper market. In other words, they would pay for scrap on a 9½ cent basis when the copper market is only 9¼ cents. thus lifting it by the boot straps.

Threats of intensive unionizing efforts in the steel industry will probably result in somewhat more adequate protection against interruption of deliveries by rational anticipation of nearby wants and more stocking by consumers. Senator Burton K. Wheel-



Chevrolet cabriolet has been added to 1936 line. When lowered, the top folds into a recess back of the front seat.

New Indianapolis Trophy

Capt. Eddie Rickenbacker, T. E. Meyers and K. E. Lyman, Borg-Warner official, unveil the $10,000 silver trophy offered by the Borg-Warner Corp. for the 500-Mile Memorial Day classic at Indianapolis. The cup contains the names and records of the 23 winners of the race, with their heads sculptured in mezzo-relief.

er's bill to eliminate the basing point method of quoting steel prices will meet with determined opposition from the steel producers who, following the elimination of "Pittsburgh plus" prices, set up a basing point system that includes Detroit and other important consuming centers. Not all steel buyers are convinced that an f.o.b. mill pricing system would work to their benefit.

Pig Iron—It is generally assumed that prevailing prices are to be continued for the second quarter. Transportation conditions continue to retard the movement of iron to automotive foundries most of which, however, have fair yard reserves.

Aluminum—Canadian exports in January were the lowest in years, aggregating only a little over 250,000 pounds, compared with more than five time that tonnage in January, 1935. Prices are entirely unchanged.

Copper—At the beginning of the week, there was still considerable copper available at 9¼ cents, neither the 9½ cent price quoted by some producers nor higher bids for scrap having affected the situation at that time. This, however, has not altered the belief of many that a sharp rise is imminent.

Tin—With speculative fever on the London Metal Exchange having abated, the market turned dull there as well as here, spot Straits being quoted early this week at 47½ cents, unchanged from the preceding week's close.

Lead—More active and steady.

Zinc—Firm.

By-Lines

By William G. Elliot, 3d, highway economist of the Bureau of Public Roads, "Drive Safely," a leaflet issued by the bureau.

"Reciprocal Trade, What It Means to the Nation," booklet published by the National Committee for Reciprocal Trade, 330 West Forty-second Street, New York, and widely distributed by organizations interested in promoting exports.

By Lieut. Franklin M. Kreml, accident prevention director, Evanston, Ill., police department, "Safe If You Heed These Rules," in the *Delineator* for March, 1936.

Electric Auto-Lite Adds Merchandising Division

Royce G. Martin, president of the Electric Auto-Lite Co., Toledo, Ohio has announced the formation of a merchandising division to handle accessory and merchandising items through the automotive replacement trade.

Frank A. Nealon will head the new division, in charge of sales, merchandising and advertising. Mr. Nealon was formerly sales manager of the Sterling Cable Corp. and the American Enameled Magnet Wire Co., Port Huron, Mich., both Auto-Lite subsidiaries. He was also connected with the Packard Electric Co. Headquarters for the new division will be located in Toledo.

Film Shows Operation and Care of Combustion Engine

"The Power Within" is the title of a two-reel silent educational motion picture film prepared under the supervision of the Bureau of Mines, Department of the Interior, dealing with the construction, operation and care of the internal-combustion engine. Animated drawings explain in detail the name, location and operation of each part of the motor. The action of the carburetor in atomizing and mixing the fuel with air before it enters the cylinders is explained in detail.

Copies of this film in 16 mm. or 35 mm. sizes are loaned by the Pittsburgh Experiment Station of the Bureau of Mines, Pittsburgh, Pa. No charge is made for the use of this film, but the exhibitor is asked to pay transportation charges.

Treaty with Spain Doubles France's Car Import Quota

Under a new commercial treaty between France and Spain, which went into effect on Dec. 21, 1935, Spain will admit during 1936 a total of French automobiles equal to the imports of 1934. During 1934 there were imported 45,363 quintaux (220 lb.) valued at 66,700,000 francs (roughly 5000 tons valued at $4,450,000). These figures are believed to represent approximately 4000 vehicles.

The treaty stipulates that, aside from the tariff duty which is regulated by the Spanish law of Sept. 16, 1931, and the decree of Dec. 10, 1931, vehicles of French manufacture will not be subjected to any higher taxes or charges than vehicles or parts of vehicles imported from other countries which benefit by a most-favored-nation clause. The Spanish government reserves the right to increase the quota of French cars to be admitted provided the original quota has been disposed of in less than ten months.

The French government will look after the proper distribution of the quota and will deliver licenses which must bear the visa of the commercial department of the Spanish Embassy in Paris. No information has been made public on the subject of the concessions made in turn by France to Spain, but they probably relate to agricultural products.

CALENDAR OF COMING EVENTS

SHOWS

Germany, Automobile Salon, Berlin, Feb. 15-March 1
Finland, Automobile Show, Helsingfors .....Feb. 25-March 1
Austria, Automobile Show, Vienna, March 8-15
Switzerland, Automobile Show, Geneva, March 20-29
Hungary, Automobile Show, Budapest, Mar.-April
Illinois Automotive Parts Assoc., Maintenance Exhibit, Navy Pier, Chicago, April 4-8
Portugal, Automobile Show, Lisbon, begins April 16
Yugoslavia, Automobile Show, Zagreb, May 2-11
Spain, Automobile Show, Madrid, May 10-20
International Petroleumn Exposition, Tulsa, Okla. .....May 16-23
Morocco, Fair of Tangiers.....May 16-24
Yugoslavia, 16th International Spring Fair, Lubliana.....May 30-June 11
France, Automobile Exhibit at Foire de Paris .....May
Norway, Automobile Show, Oslo.....May
Olympia Motor Show, London, England, Oct. 15-24

CONVENTIONS AND MEETINGS

American Society for Testing Materials, Regional Meeting, Pittsburgh, March 4
S.A.E. Tractor and Industrial Power Meeting, Milwaukee, Wis...April 15-16
American Gear Manufacturers Association, Twentieth Annual Convention, Philadelphia.....April 20-21
S.A.E. Production Meeting, Detroit, Mich. .....April 21-24
U. S. Chamber of Commerce, Annual Meeting, Washington .....April 27-30
American Petroleum Institute Mid-Year Meeting, Tulsa, Okla..May 13-15
S.A.E. Summer Meeting, White Sulphur Springs, W. Va. .....May 31-June 6
Automotive Engine Rebuilders Assoc. Annual Convention, Cincinnati, June 1-4
American Society for Testing Materials, Annual Meeting, Atlantic City, June 29-July 3
American Society for Metals, 18th Nat'l Congress, Cleveland, O.....Oct. 19-23

Motor Vehicle Inspection Reports Play Small Part

By WILLIAM S. CANNING *
Engineering Director, Keystone Automobile Club

Underwood & Underwood

As soon as the car on the left emerges beyond the semaphore Miss Eleanor Wall, who is taking the test in Washington, is supposed to shift her foot from the accelerator to the brake seen on the floor. It should be done in ¾ second

Some recent developments in highway safety practice are shown in the illustrations

THAT the accident toll incidental to the operation of the motor vehicle can and must be reduced, all of us will agree. The railroads have clearly demonstrated that they can do so, and a certain large municipal street railway system has cut the number of accidents on its system nearly in half in the past nine years[1].

That highway accidents can and have been reduced by the proper application of adequate remedies has been proven. The results obtained by two states—Connecticut and New Jersey — will serve to illustrate the point. The Connecticut Department of Motor Vehicles instituted a traffic section in 1929 for advisory and consultant service. Since then the traffic section has made surveys proposing some 2000 remedies, of which about half have been put into effect. At locations where recommendations have been adopted, accidents for the 12-month period following adoption decreased 18.1 per cent in comparison to 12 months before. At locations where they were not adopted, accidents increased 12.3 per cent[2].

New Jersey is one of the few states to have a traffic engineer; it is a recognized leader in experimental highway lighting, division of traffic on highways, safety circle and "clover-leaf" construction[3].

The effect of New Jersey's various safety measures on total accidents in three recent years over the preceding years is striking:

1932—reduction	of	16.9%	from 1931
1933— "	"	28.3%	" 1932
1934—increase	"	0.4%	over 1933

(See three Annual Reports of Commissioner of Motor Vehicles of N. J.)

These are proven results.

Among the remedies that have been tried in certain locations in the past few years in the hope of achieving results, has been the "Save-a-Life" campaign, the voluntary submission of the motor vehicle for the inspection of its vital mechanical equipment.

Inspections soon became compulsory in a few states, and in some instances were made prerequisite to registration. The plan has spread until now some dozen states have some form of compulsory inspection, and several others have permissive legislation authorizing municipalities to require inspection. Legislation is pending in several other jurisdictions.

It was the purpose of this investigation to determine how effective these campaigns have been. Some seven years of experience with the "Save-a-Life" campaigns and inspections in states requiring same affords us some basis for estimating the effectiveness of the inspection campaigns. The accident statistics of the several states are admittedly incomplete, but they are all we had to work with, and they must be used until and unless other data become available. Accident data based upon only such collisions as are required by law to be reported are insufficient, but they are the only means available for comparison.

In a broad survey of the subject,

* Mr. Canning presented this paper to the Highway Research Board, Dept. of Traffic, at Washington, D. C.

[1] P.R.T.; see Philadelphia Inquirer, Nov. 24, 1935.
[2] Conn. M.V. Statistics for 1934, page 19.
[3] See Philadelphia Bulletin, Nov. 22, 1935.

Keystone Photo

The San Francisco police have an educational car with loudspeaker to warn jay walkers

Show That Mechanical Defects In Highway Accidents

Ewing-Galloway Photo

In several instances state troopers have been used for inspection work

three questions arose to which we tried to find answers:

1. Are mechanical defects an important factor?
2. Are motor vehicles in better condition after inspection than before?
3. Has inspection (and presumably correction) resulted in decreased accidents?

We find that about 6 per cent of all vehicles registered were involved in accidents; that about 3.2 per cent of the accidents were attributable to mechanical defects, and less than ¼ of 1 per cent of all the vehicles registered were in accidents attributed to mechanical defects.

Legislation to require inspections has been introduced in states other than those shown in Table 1, but as yet has not become effective.

In the nine states having compulsory inspections by laws prior to 1935, the tabulations in Table 1 show 4,467,304 motor vehicles registered in 1934. In the nine states having whole or partial inspections authorized by the legislatures of 1935, there were 5,814,331 motor vehicles registered in 1934. The

Table 1—Status of Compulsory Inspection

As of Jan. 15, 1935, nine states were reported[1] to require periodic inspection of the equipment of motor vehicles. They are:

	1934 motor vehicle regis.[2]	Number per year
Delaware	54,240	2
Maine	178,995	2
Maryland	332,892	1
Massachusetts	785,392	1
New Hampshire	113,134	1
New Jersey	864,641	Upon proclamation
New Mexico	82,900	3
Pennsylvania	1,681,202	2
Virginia	373,908	2
Total motor vehicles registered	4,467,304	

[1] Letter from Highway Users Conference, August 7, 1935.
[2] American Highways, October, 1935, page 21.

Nine more states passed compulsory or permissive legislation during the year. They were:

	1934 motor vehicle regis.	Number per year
Colorado	274,231	2
Connecticut	357,787	2
Illinois	1,456,241	Municipalities of 40,000 population
Iowa	666,440	All municipalities
New York	2,269,355	Buses & School Buses
Oregon	274,117	Cities of 100,000 or more (Portland)
Tennessee	336,313	City of Memphis
Utah	101,926	
Vermont	77,921	
Total motor vehicles registered	5,814,331	

Table 2—1934

State	M.V. Reg.	Total Vehicles in Accidents	Acc. Caused by All Mec. Defects	Mechanical Per Cent Accidents	Defects Per Cent Regis.
City of Balto.	200,000	20,199	275	1.36	
Massachusetts.	785,392	65,976	605	0.92	
New H'm'shire	113,134	3,265	88	2.70	
New Jersey...	864,641	56,511	2,433	4.31	
Pennsylvania .	1,681,202	83,724	4,028	4.81	
Dist. of Col...	163,070	7,555	172	2.26	
Connecticut ..	357,787	26,323	550	2.09	
New York....	2,269,355	113,886	4,747	4.17	
Oregon	274,117	30,836	2,111	6.85	
Utah	101,926	3,381	134	3.96	
Virginia	373,908	17,509	823	4.70	
Totals & Aver.	7,194,532	429,165 = 5.9% Reg.	15,966	3.45	0.22

two groups embrace about 2/5 of all vehicles registered in the United States.

Are Defects An Improved Factor?

Not all of the states in either group have compiled accident records showing the number of accidents attributable to mechanical defects. Such figures as were obtainable from all sources and including one or two jurisdictions not now having mechanical inspection, are summarized in an effort to present some form of statistical measuring stick of the relative importance of the problem.

The total number of registered motor vehicles for which statistics are available is 7,194,981, which is 28.8 per cent of all vehicles reported registered in the United States in 1934[4]. This proportion must present a fair cross-section of the situation throughout the country.

From the tabulation in Table 2 certain facts stand out:

1. The 36,000 fatalities and half million or more injuries of 1934 were caused by about 6 per cent of the vehicles, and doubtless by an even smaller percentage of operators. Both operators were not always at fault in collisions involving two or more vehicles; neither were the drivers always at fault in all collisions between motor vehicle and pedestrian, nor in the cases of physical defects of the highway. It is, therefore, safe to assert that at least 95 per cent of those operating did nothing that resulted in their becoming "statistics" for 1934.

2. It appears that about 3½ per cent of all vehicles involved in accidents were determined to have been mechanically defective. The range is from 0.92 per cent in Massachusetts to 6.85 per cent in Oregon. A compact group of four eastern states (Connecticut, New York, New Jersey and Pennsylvania) registering more than 5,000,000 vehicles, each with an active motor vehicle department, present a range from 2.09 per cent to 4.81 per cent, their weighted average being 4.19 per cent.

3. Less than ¼ of 1 per cent of all the vehicles registered were reported as so mechanically defective that they became involved in accidents.

[4] Total 1934 U. S. Registrations — 24,933,403 (American Highways, Oct., 1935, page 21).

Table 3—Comparison of Yearly Inspections Percent of Vehicles Found Defective

	1930	1931	1932	1933	1934	1935
New Hampshire						
Lights	73.8	68.7	60.2	63.3	61.4	
Brakes	35.3	37.3	38.0	39.0	38.5	
Steering	6.0	6.3	5.5	1.7	7.1	
Mirrors	4.4	2.3	2.7	7.2	1.8	
Horns	4.1	3.2	3.2	3.7	3.3	
Virginia						
Lights			72.9	77.1	73.0	
Brakes			23.4	32.1	39.0	
Steering			6.1	7.1	7.8	
Mirrors			6.1	2.3	1.9	
Horns			5.8	5.3	4.7	
Wind. Wiper...			10.8	12.2	13.3	
Massachusetts						
Lights			40.0	52.0	59.0	59.0
Brakes			19.0	27.0	27.0	F. 22.0
						E. 13.0
Steering				2.0	2.0	2.0
Horns				2.0	2.0	2.0
Wind. Wiper...				2.0	2.0	2.0
Connecticut (State Inspections)						
Lights			26.0	26.5	41.2	
Brakes			37.6	10.5	14.9	
Steering			0.2	0.2	0.2	
Mirrors			2.0	1.5	2.3	
Horns			0.6	1.9	5.3	
Wind. Wiper...			2.2	3.6	4.9	
Tires (poor)...			0.6	0.3	3.7	

	1929 Fall	Sp.	Fall	Fall
Pennsylvania				
Lights	69.36	81.9	72.8	75.3
Brakes	28.39	41.1	35.9	33.9
Steering	8.53	21.5	17.5	15.8
Mirrors	5.11	4.3	4.4	2.8
Horns	3.85	6.0	3.9	3.3
Wind. Wiper...	6.8	9.7	7.2	6.8
Tires (poor)...	...	2.5	3.0	3.7

	1930	1931	1932	1933	1934	1935
Delaware						
Lights			37.0	36.0	28.0	35.0
Brakes			24.0	21.0	48.2	F. 54.0
						E. 4.7
Steering			26.0	25.0	2.1	2.0
Mirrors			1.0	2.0	1.1	0.9
Horns			2.0	3.0	1.0	0.8
Wind. Wiper...			7.0	8.0	2.1	1.3
Tires (poor)...					2.1	2.9

Table 4—Defective Vehicles Involved in Accidents

	1932	1933	1934
States Having Inspections			
New Hampshire	59	61	81
Virginia	1,131	886	688
Massachusetts	....	740	605
Connecticut	308	355	456
Pennsylvania	3,373	4,056	4,814
Delaware	124	161	144
For Comparison—No Inspections			
New Jersey	2,744	2,269	2,743
Dist. of Col.	171	195	170
Oregon	802	2,014	2,041
Maine	26	36	27
New York	3,101	3,030	3,281

Are Vehicles In Better Condition After Inspection?

Such records as are available were obtained from those states that have carried on inspections over a period of years. In most cases the data are presented for the years 1932-33-34.

The records of inspections are converted into percentages of vehicles registered, for purposes of comparison. In many cases the same vehicle was found defective in two or more items covered by the inspections.

In two states the examinations were made by state employees:

Delaware utilized state-owned and operated inspection lines, the employees having no interest in the results of inspections.

Percentage Defective

	Lights	Brakes	Steering
Connecticut & Delaware	26—41	10—54	0.2— 2.1
Other states ..	40—82	19—41	1.7—21.5

The condition of lights shows improvement in New Hampshire only, over a period of five years. In all the other states there is no perceptible improvement and in some cases they appear to be worse.

Brakes appear to be about the same, or perhaps a little worse. (Connecticut excepted.)

Steering gear shows little change, although we find that condition much worse in Pennsylvania than any other state.

On the whole, little or no improvement can be noted, and the wide spreads between the percentages between several states give rise to doubt as to the accuracy of the reports, the methods of inspection or the need for a job by the "inspecting stations."

Has Inspection Resulted In Decrease of Accidents?

If the results of inspection, as reflected in accident statistics, are to be studied, only those accidents that are attributed to items covered by inspections may be considered. This rules out skidding or no chains on slippery roads. Punctures and blowouts are questionable, but since some states inspect tires, they are included, even though the percentage in bad condition (fabric showing) is small.

Of the six states having conducted inspections of some sort over a period of three years or more, Virginia only shows a consistent reduction of accidents in which defective vehicles were involved: a decrease of 23.5 per cent in 1933 from 1934, and 20.6 per cent in 1934 from 1933. The others show an increase.

Little of significance is apparent from the other states, except that no marked change is to be noted. Oregon shows a 150 per cent increase from 1932 to 1933, but only 1.3 per cent increase of 1934 over 1933.

Conclusions

On the face of the figures, three rather negative conclusions appear:

1. That mechanical defects, as factors in highway accidents, play a very small part, perhaps the smallest of any single cause.

2. That compulsory mechanical inspection has not resulted in a consistent improvement in the mechanical condition of the vehicles from year to year.

3. That mechanical inspection (and presumably correction of the defects) has not resulted in a reduction of the accidents attributed to this cause.

International Photo

At the left is seen a practice that New York has outlawed. Below is safety clinic to prevent mechanical defects that might lead to trouble

International Photo

Connecticut utilized state inspectors who made highway tests of only a part of the entire registration of the state. This year they are employing the plan used in Delaware.

The remaining states utilized "Official Inspection Stations," i.e., service garages appointed by the Motor Vehicle Commissioners.

The character and percentage of defects found by the two methods is worthy of note:

Five Bending and Restriking One Press on Radiator Grille

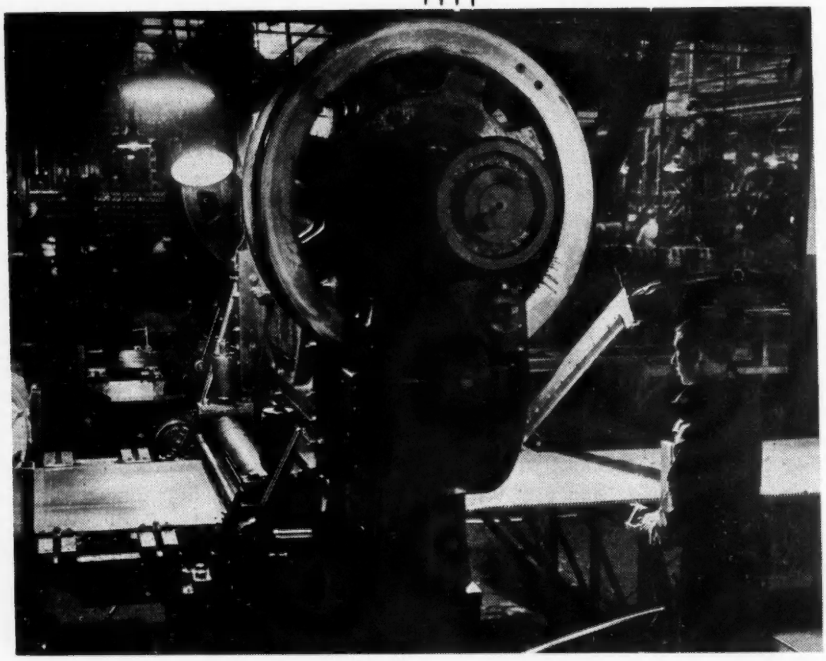


Fig. 1—The first operation in the manufacture of the "silver streak" radiator grille for the new Pontiac. At the left plain strip comes off a roll and passes through the press where the grille pattern is stamped into it. The large knife at the right is used to cut the steel into sheets of workable length

THAT added touch of distinctiveness contributed by the Pontiac radiator grille for 1936 is also a distinctive and most exacting manufacturing operation. And it proves that Pontiac is willing to pay well for anything that contributes to eye-appeal and consequent public acceptance. Special press equipment, costly dies, and a special manufacturing department are required to produce the graceful latticed front.

Some of the operations developed in this department should be of more than passing interest not only to other car builders but to the many parts makers who supply the industry with many essential units. We were particularly impressed with a number of press operations which feature multiple dies so arranged that forming and restrike are handled in the same setting.

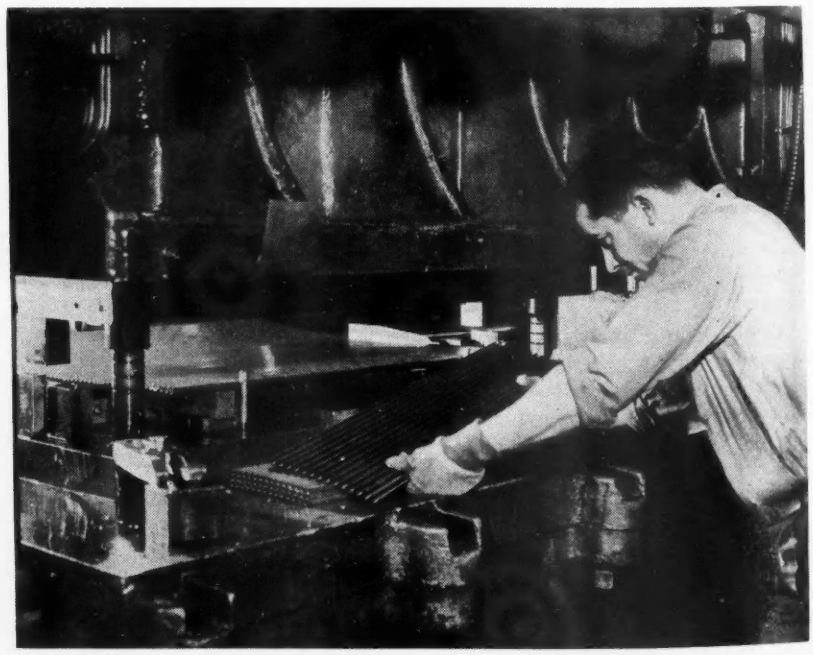


Fig. 2—The sheets that have come through the press with the pattern of the radiator grille stamped in them are cut into the right sized sections for the individual radiators by this press

Operations Made in for the '36 Pontiac

Fourteen general operations, with a rather large number of subdivisions, such as metal finishing and polishing, are required to turn out the completed grille. Blank stock comes to the press room in the form of large rolls of wide strip steel and is fed through the first operation press which is fitted with an automatic corrugating and piercing die. One pass through the machine forms and pierces the pattern and design of the grille. The operator, see Fig. 1, cuts the finished strip into workable lengths about eight feet long, using a large, counter-weighted knife.

Following this, the sheets are cut into proper widths, the flanges flattened, ends trimmed and flanges bent. These are all separate operations. Then the surface curves are developed and the pieces notched for fastening.

Next is the most interesting and probably the most intricate press die operation in the Pontiac sheet metal plant. A combination of five individual bending and restriking operations are performed in the press, shown in Fig. 3, bending the top curve over the top of the radiator; bending the bottom curve, followed by three restriking operations which put the finishing touches on the contour.

In operation, the flat grille stock is placed in the die at the extreme right and clamped in place. This station forms the "top" bend. The work is then transferred to the station at the extreme left where it gets the "bottom" curve. Three other stations, at the rear, complete the restrike operations. A feature of the tooling, as is evident, is the massiveness of the individual die sections as well as the devices employed to assure accurate alignment throughout. The elements of the two forming dies are so intricate that it is necessary to open the clamps and free the work before the ram is released on its upward stroke.

After these five press operations there follows the trimming of top and bottom; restriking the top; notching out the crankshaft hole; piercing the fastener holes and then metal finishing and polishing.

Making beautiful but complicated radiator grilles like Pontiac's, provides employment for a large number of men who would not have had jobs in the old days when the radiator and its shell stuck right out in the open.

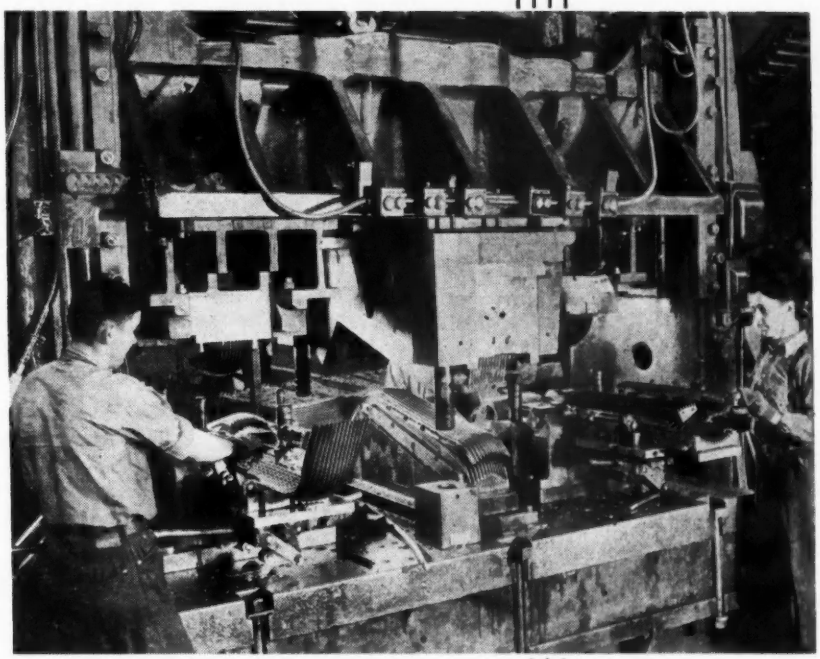


Fig. 3—The most intricate of the operations in the Pontiac sheet plant are those which bend and form the "silver streak" front radiator grille. There are five dies in this press

Marine Diesel from Bolinders

A TWO-STROKE Diesel engine for marine purposes has been developed by S. G. Bolinders A. B. of Stockholm, Sweden, an old-established firm in the oil-engine field. It is made in a single cylinder size, of 3.94-in. bore by 4¾-in. stroke, in one-, two-, and four-cylinder types. The output is 10 hp. per cylinder at 1000 r.p.m., though the engines are said to be able to stand speeding up to 1500 r.p.m. At the rating given, the b.m.e.p. figures out to 69 lb. per sq. in., which is quite high for the crankcase scavenging type, to which this engine belongs.

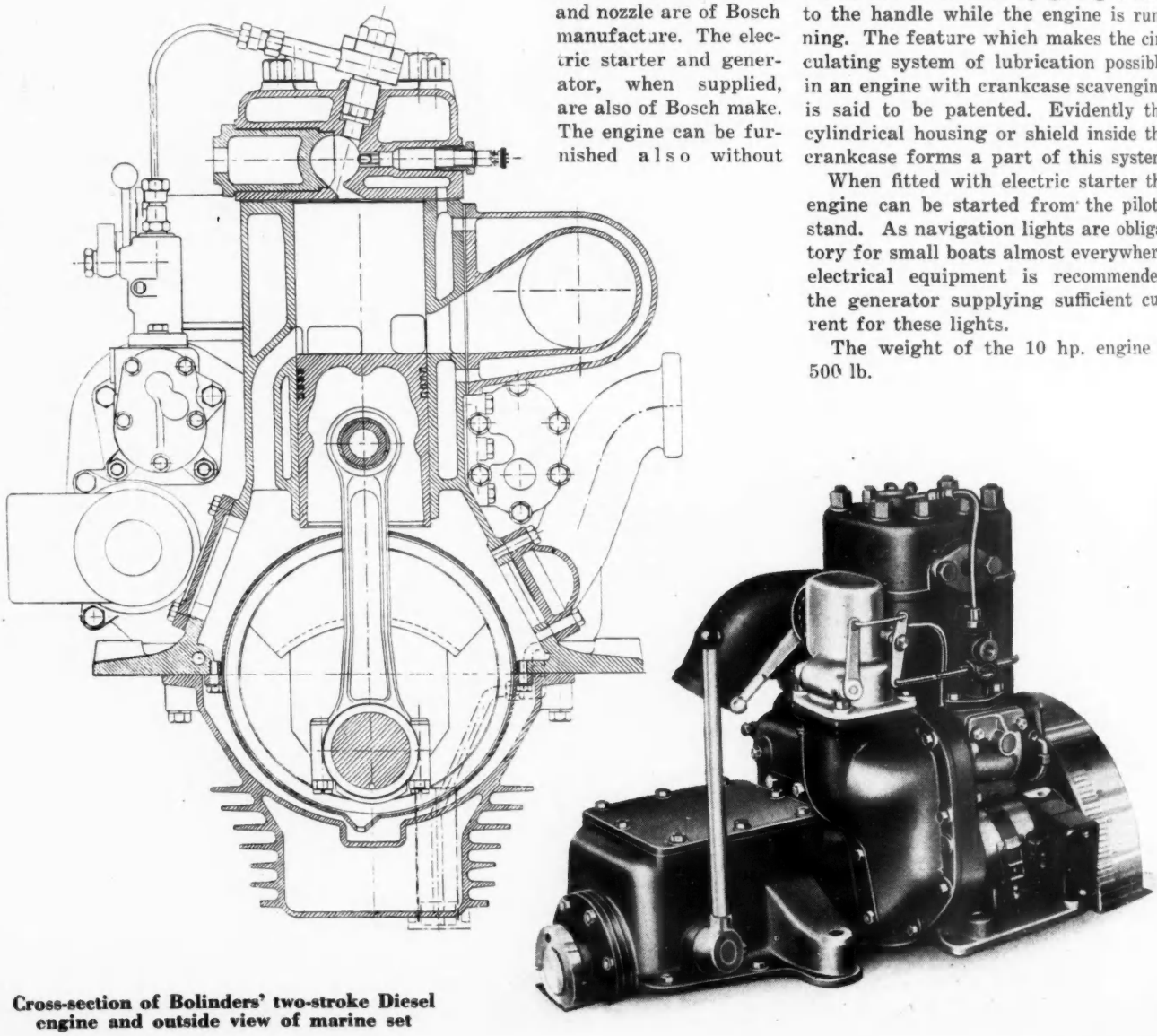
Cylinder and cylinder head are cast of chrome-nickel cast iron. The piston is of aluminum alloy and the crankshaft of heat-treated chrome-nickel steel. The same material as for the crankshaft is used for the connecting rod. "Through" bolts hold the engine block, cylinder head and main-bearing caps together, so that the block is relieved of all gas-pressure stresses.

It will be seen from the sectional view that the cylinder head is provided with a turbulence chamber, which is said to prevent Diesel knock. It also makes it possible to use a quite low injection pressure, as the air flow helps to distribute the fuel throughout the air charge. A glow plug is secured into the wall of the turbulence chamber to permit of cold starting. The injection pump and nozzle are of Bosch manufacture. The electric starter and generator, when supplied, are also of Bosch make. The engine can be furnished also without electric starter, equipped only with the glow plug for direct starting by hand, or designed for direct injection into an undivided combustion chamber for cold starting (without the glow plug). The compression ratio is 16 to 1.

A centrifugal governor is fitted, which acts on the delivery control of the fuel pump. A continuous-circulation system of lubrication is used, in spite of the crankcase scavenging. Oil is taken from the sump by the gear pump and forced to the main bearings. The surplus oil is discharged through the governor chamber, lubricating all of the moving parts therein, on its way back to the sump. A metal-edge filter is provided in the lubricating system, which can be cleaned by giving a turn to the handle while the engine is running. The feature which makes the circulating system of lubrication possible in an engine with crankcase scavenging is said to be patented. Evidently the cylindrical housing or shield inside the crankcase forms a part of this system.

When fitted with electric starter the engine can be started from the pilot's stand. As navigation lights are obligatory for small boats almost everywhere, electrical equipment is recommended, the generator supplying sufficient current for these lights.

The weight of the 10 hp. engine is 500 lb.



Cross-section of Bolinders' two-stroke Diesel engine and outside view of marine set

JUST AMONG OURSELVES

Herbert Hoover On R. D. Chapin

"THERE was no limit to his courage." So writes Herbert Hoover of Roy D. Chapin in a telegram to us, delayed because of Mr. Hoover's absence from Palo Alto.

The remainder of Mr. Hoover's tribute is as ultimate in its implications, and may well stand as the final word on the life of a man whose talent for friendship was equaled only by his talent for well-founded business success. Mr. Hoover says:

"Roy Chapin was my friend over twenty years' period. I had contact with him in many public activities from that time down until he became Secretary of Commerce. At that time I worked in cooperation with him many times daily. He had an extraordinary fund of common sense and sanity.

"I know of no man in the industrial world who had higher ideals for public service than Mr. Chapin. He was everything one wants in a friend and in an American. His passing is a loss to the country."

To the flood of reminiscences which have come forth since Mr. Chapin's death, we should like to add one. A recent visit to Detroit is remembered for its brightest hour, which was spent in Mr. Chapin's office. The conversation ranged over all the topics which might be considered of interest to automotive executives. Mention of labor was inevitable.

Before replying to a direct question, Mr. Chapin reached back of his chair to a bookcase and pulled down a book on socialism. "I'm reading this," he said, "and I'm more convinced than ever that what labor is being offered by its leaders is neither fish nor fowl, but a bundle of delusions. But I do want to find out what these fellows are talking about."

And he went on to explain that the process of finding out included scores of conversations with taxi-drivers, railroad brakemen, salesmen, all the people one might meet on a journey. We are sure he got true answers about their personal beliefs from the people he talked to.

Roy Chapin was that kind of a man. You could talk to him and he would talk to you, and it was straight talk.

Publicity Doesn't Prove a Point

IN the past few weeks the business and daily press have referred frequently to a new material called Polaroid, which possesses the quality called dichroism—the ability to break down natural light into two plane-components, and to suppress one of these components while allowing the other to pass through.

The principle, of course, is not new. Its principal interest for the automobile world lies in the fact that the new material is claimed to be cheap enough to permit installation in headlamps and windshields, thus preventing glare.

The effectiveness of the material would be in direct proportion to the number of installations on the road. In other words, if two cars are approaching each other at night, each would have to have headlamps and windshield Polaroid-treated in order for either driver to get freedom from glare. This freedom is obtained at the cost of a certain loss of light-intensity, and the cost of installation.

On the latter point darkness still prevails. So long as the practical utility of Polaroid hinges on whether the new material can be offered cheaply enough to make wide installation as new and replacement equipment on motor vehicles economically possible, we feel that the sponsors of the material owe the industry a fuller explanation of their claims.

Study in Relative Taxation Rates

TO its many valuable studies of the position of automobiles in the national economy the National Highway Users Conference has added the facts that in the period from 1932-34 inclusive, the valuation of all motor vehicles increased 9.4 per cent, total taxation on the vehicles increased 22.3 per cent and the rate of taxation increased 11.4 per cent.

The valuation of Class 1 railroad property decreased 2.2 per cent in the same period, tax accruals on the property decreased 13.1 per cent, and the rate of taxation decreased 11.1 per cent.

Do You Like Our Pictures?

SEVERAL weeks ago we introduced without fanfare a weekly page of pictures called "The World on Wheels." The pictures are selected carefully from those offered by the principal news-picture sources of the entire world. We'd be glad to have suggestions from readers on the type of pictures they'd like to see included. What's yours?—H. H.

The Horizons of Business

By Joseph Stagg Lawrence

Government Marches On

IN a famous early case under the Interstate Commerce Act the Supreme Court was asked to decide if the storage conditions established by a grain elevator could be construed as a phase of interstate commerce properly subject to the authority of the Interstate Commerce Commission. In deciding this question in the affirmative the court used the phrase "affected with a public interest" as applied to the service rendered by the elevator. It was the task of the judicial mind to weigh the degree to which a service was affected with this public interest and determine the precise point at which the jurisdiction of the I. C. C. could be admitted.

A Great Issue

The phrase reached the heart of a great issue which has divided the opinion of scholars, lawyers, business men and statesmen for a century and a half, namely, whether the government should regulate business, the precise point at which regulation should begin and the nature of the regulation.

It was Adam Smith who roused the thinking men of his day to a realization that most of the ills of government were caused by too much government, that reform lay in the direction of a simplification and reduction of government functions. For the next 50 years in England, and in this country for the next century, the pendulum swung in the other direction. Within the last 50 years and at a greatly accelerated pace during the past three years the influence and authority of the government have been extended. The greater part of private enterprise emancipated by the cumulative abuses of excessive government toward the end of the 18th century, by the penetrating logic and acid comment of Adam Smith has been restored to the questionable embraces of the state. The issue today seems to be "How far is the action of the government affected with a business interest?" The question unfortunately seems to apply to every act of the government.

Grief Upon the Potomac

The lamentations from the north bank of the Potomac during the past year leave the uninformed observer with the impression that the Supreme Court has flagrantly usurped large areas of executive and legislative power and left a benign government inadequately equipped to protect a helpless people and restrain the greed of predatory private groups. The anguish following the Schechter and AAA decisions was something to behold. The wailing walls in the Capitol were drenched with the tears of selfless public officials while statesmen actuated only by *pro bono publicum* singed the pure atmosphere above. Capitol Hill with flaming invectives hurled unerringly at nine old men lost in a beautiful marble palace. The heralds of progress ready to proclaim the millennium had been sandbagged, emasculated and otherwise thrown for a loss by a group of ridiculous old men wearing black night-gowns. It was a case of nine against a solid phalanx of brightly burnished brain trusters, aided by the amiable if parasitic hosts of "practical" politics. The spirit progress is the leader of this second group. There is a cheering section with several million veterans, farmers, silver miners and boondogglers, all yelling lustily for a bigger slice of the more abundant life which the aforementioned nine old crusty fellows seemed disposed to deny.

Since one Ashwander and various associates were unsuccessful in persuading the Supreme Court to write *Verboten* across An Act Creating the Tennessee Valley Authority the curtain has dropped on *Grief Upon the Potomac*. As a tragedy of the first order it was well conceived and a tribute to the talents of the actors and the genius of the authors. It utterly lacked any substance in fact.

Vanishing Havens of Enterprise

The truth is that the authority of the state has been so far extended that hardy a refuge remains in which private enterprise may operate without the assistance of the government. The founders had a wholesome dread of excessive government and did their best, indeed created a masterpiece, as Lord Bryce testified, to keep government within bounds that would permit individual liberty and economic progress.

The entering wedge was driven when the Interstate Commerce Act was passed in 1887. There is no gainsaying that the railroads had by their conduct made this intercession inevitable. They offered a convincing example of rugged individualism gone ragged, oppressive, larcenous and wasteful. The Sherman Anti-Trust Law which followed in 1890 had a case that was plausible but lacked the full justification of the I. C. C. Act.

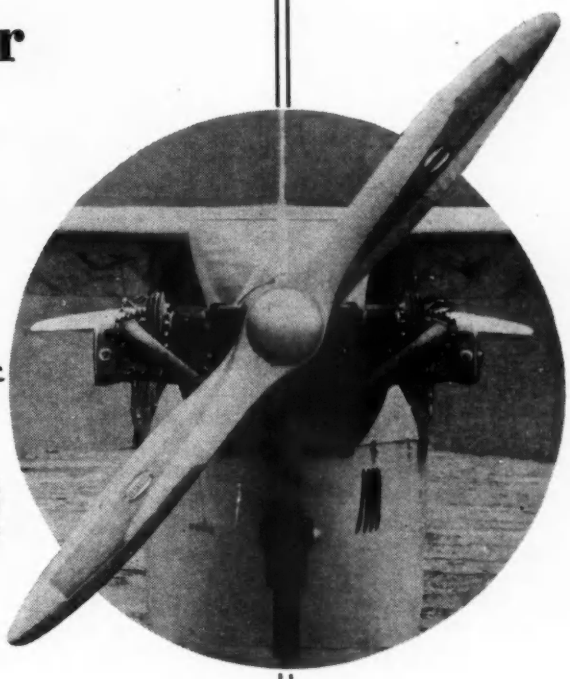
Excepting amendments clarifying and strengthening the latter act the forces of reform held their fire until 1913, when the Federal Reserve Act was passed. This was no piece of impulsive rainbow chasing with a "must" tag attached. It was the result of some seven years of solid study and consideration by a Congress which was still a deliberative body and not a bunch of ten-grand-a-year political playboys eager to go home. This was followed in 1916 by the Federal Farm Loan Act establishing 12 Federal Land banks which, operating through farm loan associations sold tax exempt bonds and loaned the proceeds to farmers on first mortgages. In the interval between these two acts the Federal Trade Commission had been established and the Clayton Act placed additional safeguards about free competition, the senior deity of *Laisser Faire*.

Reform Carries On

There follows an interregnum of a generation during which the forces of progress, encouraged by the example of Moscow and the clarion battle trumpets of *The Nation* and *The New Republic*, awaited Der Tag. In spite of the widely proclaimed breathing spell for business we are still enjoying this Judgment Day of liberal thought. To define the progress of social control during the last three years calls for a history of the New Deal which must be written by observers whose detachment

(Turn to page 346, please)

New Aeronca Two-Cylinder Engine Gets Department of Commerce Approval



Aeronca E-113C engine mounted on a C-3 Aeronca plane

AN approved-type certificate was issued recently by the Department of Commerce for a new Aeronca two-cylinder opposed aircraft engine, the E-113C. This engine, which is the product of Aeronautical Corporation of America, Cincinnati, Ohio, is intended for light planes for private use. A photograph of this engine, installed in the 1935 Aeronca C-3, two-place airplane is reproduced herewith, as well as a photograph of the connecting rod and crankshaft.

The engine has a bore of 4.25 in. and a stroke of 4 in., which makes its displacement 113.5 cu. in. A compression ratio of 5.4 is used, and the engine has a Department-of-Commerce rating of 36 hp. at 2400 r.p.m., while the manufacturer rates it at 40 hp. at 2500 r.p.m. This latter rating is based on the use of a fuel of 73 octane number. The weight of the complete engine, including propeller hub, is 121 lb.

The crankpin bearings of the new engine are of the Federal Mogul Company's new cadmium-silver-copper type, with a steel backing. An advantage of these bearings is that they can be easily replaced in service, as they are held in the connecting rod by a small notch and can be slipped out after the cap has been removed. The bearings are finish-broached to size, and no fitting is necessary. The forged nickel-steel connecting rod has been redesigned to take this new bearing.

No change has been made in the design of the crankshaft, which is case-hardened on the crankpins. The crankshaft is finish-ground all over, which is said to give it a high fatigue strength. Pistons are of the Permite heat-treated aluminum-alloy type, with heavy ribbing at the upper end. They carry two ⅛-in. compression rings and one 3/16-in. oil ring each. The clearance between the piston pin and piston has been reduced. Nickel-molybdenum steel is the material of which the piston pin is made, which is held in place in the piston bosses by two small snap rings.

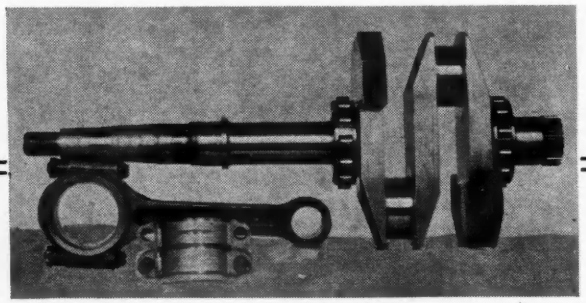
The main part of the crankcase is a single heat-treated aluminum-alloy casting; it is of streamline shape and contains the oil reservoir of 3-quarts capacity in the lower part. The front of the crankcase is finned, to allow the air stream to cool the oil in warm weather. In cold weather this section can be covered by a metal shield, to maintain the proper oil temperature. The main section of the crankcase contains the front ball thrust bearing and the forward main roller bearing of the crankshaft, as well as the camshaft, which latter is mounted on two ball bearings. The cam-follower housings are also in the crankcase, and are made of Permite heat-treated aluminum alloy. All of the necessary drives are at the rear of the engine. The heat-treated aluminum-alloy back-plate, which is attached to the rear of the crankcase, contains the rear main roller bearing of the crankshaft, as well as the accessory-drive gear train and the oil-relief valve.

Cylinder heads are of cast aluminum alloy, heat-treated, and contain the rocker arm housing as an integral part. The valve seats are aluminum-bronge forgings and are shrunk into the head. The valve guides are aluminum bronze and are also "shrunk in." The heads are bolted to the steel cylinders.

The cylinders are machined from chrome-molybdenum heat-treated steel forgings. The valves are of the full tulip type and have been re-designed to use the new double groove valve spring retainer lock, which is said to greatly increase the strength of the valve at the tip end. Intake and exhaust valves are interchangeable. Double valve springs are used, and the two springs are coiled in opposite directions.

Each rocker arm is mounted on two ball bearings, which are of the full type and have shields on one side. The rocker arm bearings and outer push rod sockets are lubricated through Alemite-Zerk fittings on the end of each rocker arm shaft. The push rods are of dural, with hardened steel ball ends, and are enclosed in aluminum push-rod tubes. The cam followers are of the roller type and slide in Permite aluminum alloy housings in the crankcase.

Because of the plain bearings on the crankpins, a high-pressure oiling system is used. The other bearings of the engine, being of either the ball or roller type, are lubricated by splash.



Federal-Mogul cadmium-silver-copper steel backed bearings and crankshaft assembly for Aeronca 113-C engine

The oil reservoir is in the bottom of the crankcase, and the oil is taken from this reservoir through a special oil strainer to the oil pump mounted in the gear cover, and from there to the crankpin bearings. This oil line also goes to the oil-relief valve at the top rear of the engine, and to the oil pressure gage connection. From the oil-relief valve, the excess of oil is allowed to flow into the front nose section of the crankcase, which is separated from the cylinders by a wall, and from there into the oil reservoir. By allowing the oil to flow through this section of the crankcase, the front thrust bearing is oiled, and heat is taken from the front main roller bearing and the center wall of the crankcase.

The oil thrown from the crankpin bearings lubricates the cylinder walls and also the camshaft bearings, and then collects in the interior sump of the engine, from where it is transferred to the oil reservoir by the scavenger pump. An oil pressure of 55-60 lb. gage is normal for this engine. The oil level in the reservoir can be checked by means of a slight oil gage at the top on the left side of the crankcase. This is very handy in long flights, as it enables the pilot to determine the amount of oil left in the crankcase at a glance.

A rather elaborate breathing device is necessary to keep the engine clean and to prevent loss of oil, because the two pistons travel inward at the same time, thereby compressing the crankcase air. This device consists of a small flapper valve, which allows the air to flow only in an outward direction, into the oil separator. This latter is designed to prevent loss of oil into the atmosphere, while allowing the air to escape. The oil is deflected downward in the separator and drains from the bottom through an oil line into the crankcase proper. Air is allowed to escape upward through the separator and out through the metal screen. This device produces a slight vacuum in the crankcase, which is desirable because it prevents oil leaks at various joints of the crankcase. The vacuum also draws the oil out of the separator, through a ball check valve.

A Bosch magneto is used, with an impulse coupling for easy starting. The spark is controlled automatically, through a lever connecting with the throttle lever on the carburetor, thus eliminating one control. Automatic spark control reduces the stresses on the engine and permits of a lower engine speed when landing the plane, as the control is entirely by the throttle lever.

A Stromberg aircraft carburetor is standard equipment. An air-intake heater is attached to the long Y exhaust pipe and furnishes heat to this carburetor.

Trade Literature Available

The Manhattan Rubber Manufacturing Division of Raybestos-Manhattan, Inc., Passaic, N. J., has just issued a new catalog describing its line of Condor industrial friction material.

Venturafin unit heater catalog and engineering application guide has just been issued by the American Blower Corp., Detroit, Mich.

How SKF bearings can replace plain bearings on fans and blowers is explained in a new bulletin, "SKF Bearings and Housings for Fans and Blowers" issued by SKF Industries, Inc., Philadelphia.

The Link-Belt Co., Philadelphia, has recently published a 32-page catalog on its line of single, double and triple reduction herringbone-gear speed reducers.

Complete illustrations and tables covering the line of Superior ball and roller bearings are included in catalog No. 12 of the Ball & Roller Bearing Co., Danbury, Conn.

The Wilmington Fibre Specialty Co., of Wilmington, Del., has recently printed a new catalog covering its various fibre products.

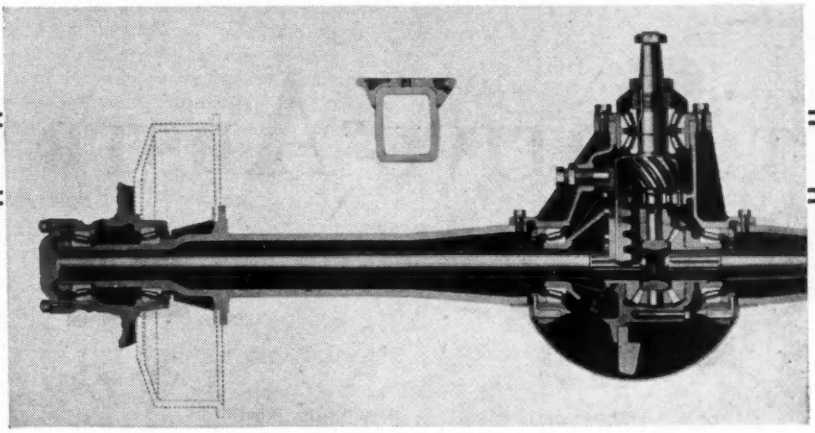
Its full line of Skilsaw portable electric tools is covered in catalog No. 36 of Skilsaw, Inc., 3310 Elston Avenue, Chicago.

The Horizons of Business

(Continued from page 344)

and perspective is somewhat better than our own. Very little has escaped the attention of Washington.

In the field of banking the authority of the government has been greatly extended through the Banking Act of 1935, the insurance of bank deposits, the loans to banks by the R.F.C. and investments in the stock of some six thousand institutions. The Securities Act of 1933 attempts to control the issue of new securities, while the Securities Exchange Control Act aims at the regulaton of stock exchanges. The provisions of these acts involve substantial authority over the corporations whose securities are affected. Agriculture, power production, communications and transportation feel the hand of the federal government to a vastly greater degree. More or less indirectly the monetary policies of the government, the tariff, taxation, government expenditures, relief and the regulation of labor relations are all substantially affected with a business interest. We have traveled far during the last three years. Adverse decisions of the Supreme Court are a grateful but, as in the case of the AAA, an apparently illusory and abortive interlude.



Section through Timken bevel-gear drive, full-floating rear axle (Models 53300, 54400, 56400)

A Two-Speed and Three More Double Reduction Axles by Timken-Detroit

TIMKEN-DETROIT AXLE CO. has made a number of improvements in three of its rear axles for medium-duty trucks, known as the 53300, 54400 and 56400. For each of these axles there is now available a double-reduction drive unit which is interchangeable with the regular bevel-gear drive unit. Equipped with the double-reduction drive units the axles are known as the 73300, 74400 and 76400.

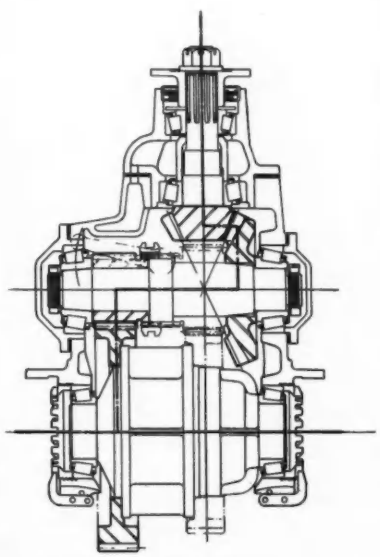
For the 53300 there is also available a two-speed drive unit, and when the axle is equipped with this it is known as the 93300. We understand that two-speed drive units for the other two axles are ready for production. The second speed is obtained in these drive units by the simple expedient of adding another pair of spur gears to the double reduction drive, and engaging one or the other of the two spur pinions with the shaft of the driven bevel gear by means of a sliding collar provided with internal clutch teeth. The two-speed drive is interchangeable with the bevel-gear and double-reduction drive units.

Gear ratios available with the different axles are as follows:

Series Axle	Final Drive	Available Gear Ratios
53300	Bevel	5.14-5.66-6.60
73300	D.R.	7.35
93300	2-speed	5.27-7.06
54400	Bevel	5.83-6.80
74400	D.R.	7.35
56400	Bevel	6.16-6.83-7.40
76400	D.R.	8.21

As to the general improvements in these axles, the axle housings are of the welded all-steel full-floating type. The banjo housings are pressings of heavy stock, and the outer ends or spindles are butt-welded to the housings. Brake flanges are integral with the spindles. Housing covers are heavy steel stampings and in the two larger sizes they are welded in place, to increase the resistance to deflection. Axle shafts are cut with 16 splines at the inner end, of a special design which makes the splines on the shaft as strong as those in the gear. The core diameter is larger with these splines, and the general design of the splined portion is such as to prevent localization of stress. The wheel bearings are of larger capacity than formerly and have a wider spacing, to assure stability with dual tires. A micrometer adjustment with positive lock is used. Bevel gears are of larger diameter and have a longer tooth face.

The double-reduction gears are mounted in a differential-carrier unit, as shown in the cross section, and are made by the Wisconsin Axle Co., a Timken division. The first reduction is by spiral bevel gears and the second by spur gears. Cast alloy iron brake drums are standard equipment and two-shoe brakes of three different makes are available.



Arrangement of Timken two-speed axle drive

AUTOMOTIVE ABSTRACTS

Advantages of Supercharging Diesel Engine Besides Power

IN a gasoline engine the permissible supercharging is controlled by detonation, but in a Diesel engine, where the fuel is injected toward the end of compression, this limitation does not exist. In a Diesel engine there are other important advantages in supercharging besides the increase in power. The ignition lag is reduced, the lag being very nearly inversely proportional to the absolute pressure of induction. Any reduction in the ignition lag results in a reduction in the rate of rise of the gas pressure, as shown in Fig. 1. These diagrams were taken from a 6 by 6.5-in. engine at 2000 r.p.m., at induction pressures of —3, 0, +3 and +6 in. of mercury column. The injection advance was varied to keep the maximum combustion pressure constant, and amounted to 18, 16, 15 and 14 deg. for the four induction pressures respectively. The period of injection was adjusted for each condition to the limit for clean exhaust.

The maximum pressures measured on the diagrams are shown by the points forming the curve P_c in Fig. 2. The tests were made with the induction temperatures increased to represent conditions with the blower installed close to the engine, and the readings were then corrected for the torque required to drive the blower, assuming it had an adiabatic efficiency of 60 per cent. The observed induction temperatures and the calculated blower torque, expressed as engine m.e.p., are shown by curves IT and ST of Fig. 2 respectively.

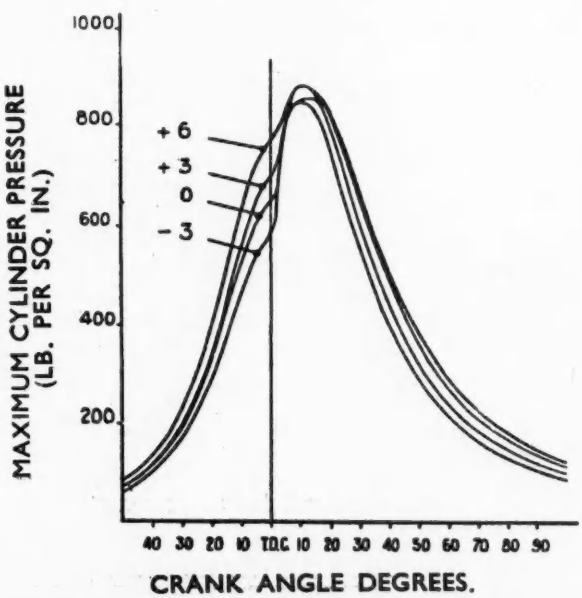


Fig. 1—Time-pressure diagrams from Diesel engine with inlet pressures of —3, 0, +3 and +6 in. of mercury column.

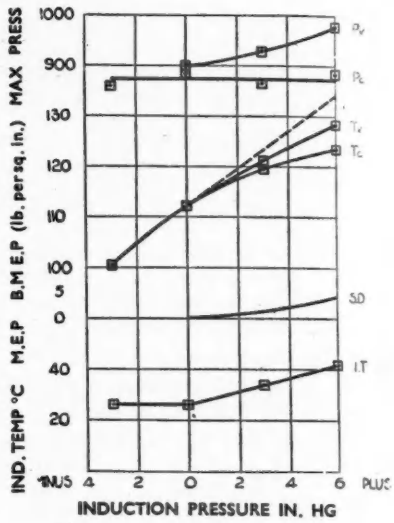


Fig. 2—Curves of induction temperature, m.e.p. corresponding to power required to drive supercharger b.m.e.p., and maximum combustion pressure.

A further set of tests at 2000 r.p.m. and at the limit of clean exhaust was made with the injection timing fixed. In Fig. 2 the observed maximum pressures are shown by curve P_v and the net torque output by curve T_v. It will be noticed that the maximum pressure was increased only 7 per cent for a 20 per cent increase in the absolute induction pressure. There was an increase from 112 to 127 lb. per sq. in. in the b.m.e.p. at the limit of clean exhaust, a net gain of 13½ per cent.

The measured fuel consumption at reduced loads was lower when supercharging, but the difference was exactly equal to the work done by the pressure of supercharge during the suction stroke. Had the engine been driving its own blower, the consumption would have been higher by an amount equal to the net loss in the blower.

With an oil engine, when the power demanded falls below the maximum obtainable without supercharging, the supercharger may be unloaded by by-passing the air delivered by it to the inlet side. In that case the loss in the blower is reduced practically to its internal friction.

From the tests described the author expects the following results from a commercial-vehicle engine of 130 hp. at 2000 r.p.m. Assuming a pressure-controlled supercharge of 6 in. of mercury, an unaltered compression ratio, and fixed injection timing—

1. Maximum b.m.e.p. would be increased 13.5 per cent.
2. Maximum cylinder pressure would be increased 7 per cent.
3. Fuel consumption at half the original full torque and at two-thirds of full speed would be increased 3 per cent, but for equal proportions of full load the specific consumptions would be unchanged.
4. The total weight of the power unit would be increased 5 per cent.
5. Combustion knock at full torque would be very much decreased, due to shortening of the ignition lag.

The question might be asked—"Cannot the same increase in torque be obtained more economically by increasing the size of the engine than by supercharging?" According to the author, from the first-cost standpoint it could be done more economically, but the difference would not be great. A blower suitable for a 150-hp. engine at present sells for

£50, but the cost could no doubt be greatly reduced if such blowers were produced in fair quantities. On the other hand, the supercharged power unit of 150 hp. would be 120 lb. lighter. With respect to fuel consumption the performance should be the same within 1 per cent.

The author concludes that from what experience he has had in the supercharging of oil engines he believes it will be found to pay on account of the saving in weight.
O. Thornicraft in *I.A.E. Journal* for December.

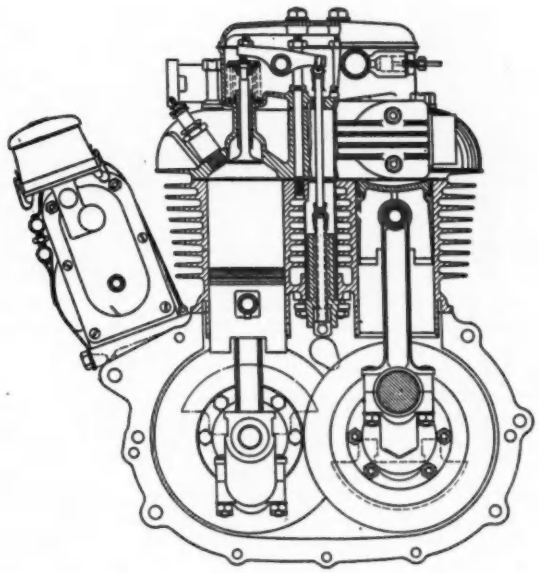
Chromium for Bearing Surfaces

FINE coatings of chromium on bearing surfaces, resistant to wear and corrosion, are produced by a process developed by Fescol, Ltd., of London. It is claimed that when the plated surfaces are polished, they take on remarkable anti-friction properties. The process has been applied to dies used in cold drawing and is claimed to have multiplied their life as many as 30 times. In addition, the product is said to be improved, as the drawings show no flow or stress marks. When the dies show signs of wear, the chromium coating can be renewed and the dies brought back to their original condition. Molds for plastics are being treated by this process in large numbers, as such molds give highly finished surfaces on the molded objects. Broaches treated by the process are said to have materially increased life. The process has been applied also to arbors and boring bars, plug and ring gages. Of automobile parts the one which can be improved most by the process is apparently the crankshaft. Certain new bearing materials recently introduced call for harder journal bearing surfaces than that obtained with the ordinary crankshaft steel. A crankshaft of a Diesel engine running in light alloy bearings is said to have given 51,600 miles of road service without appreciable wear.—*The Automobile Engineer* for January.

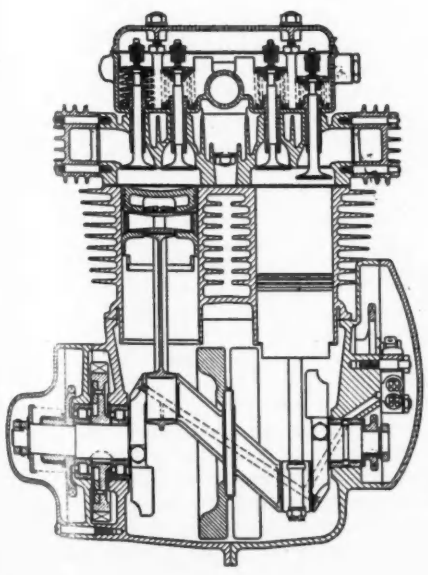
Air-Cooled, 4-Cyl. Motorcycle Engine

AERIAL WORKS, LTD., of Birmingham, at the recent London motorcycle show exhibited a new model of its unconventional design of four-cylinder air-cooled motorcycle engine with two crankshafts geared together. In the new engine, of 61 cu. in. displacement, the camshaft is located in the crankcase instead of overhead, and the coupling gears are located at the driving end instead of at the middle of the crankshafts. Cylinder dimensions are 2.56 by 2.96 in. The four cylinders are in a single casting which is secured to the top of the vertically split crankcase. Each two-throw crankshaft is supported in a bronze-back babbitt-lined bearing at the timing end and in a large-diameter roller bearing at the driving end, where the coupling gears are housed in a separate compartment. The rear shaft, from which the primary chain drive to the gearbox is taken, is furnished with an additional roller bearing outside the gear wheel. The spur-type coupling gears are ground on the tooth profiles, and into the rim of each is pressed a fiber disk to damp out resonant vibration. There is one flywheel on each of the crankshafts, the two flywheels being bolted to opposite sides of centrally located flanges on the crankshafts, thus permitting their rims to overlap. Crankpins and journals are hardened, and connecting rods are made of the aluminum alloy Hiduminium.

The single exhaust manifold is cast integral with the cylinder head casting. Detachable finned exhaust manifolds, each serving two cylinders, are bolted to opposite sides of the head casting. Duralumin pushrods are used. To prevent interference with the free flow of air over the cylinder fins, the combined generator and ignition magneto is mounted at an angle. A compression ratio of 5.8 is used, and the engine is said to be capable of running in excess of 6000 r.p.m. The motorcycle fitted with this engine weighs 410 lb. and is said to have a top-gear speed range when used as a solo machine, of from 10 to 100 m.p.h.—*The Automobile Engineer* for January.



Longitudinal sections of Aerial four-cylindered motorcycle engine.



Transverse section of the Aerial four-cylinder motorcycle engine

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Aluminum Heads at Paris Show

AT least eight manufacturers of passenger cars and three of trucks exhibited, at the last Paris automobile show, vehicles with cylinder heads of aluminum. Two alloys have proved quite popular for this purpose, by reason of their good casting qualities, their mechanical properties, and their low cost. The most widely used contains 8 to 10 per cent of copper, to which from 1 to 2 per cent of silicon is added. This addition tends to prevent cracking, especially at the junction of bosses with the upper and lower decks.

This is the alloy used by Ford. It is quite similar, moreover, to an alloy containing 6 per cent of copper, which is used by some British manufacturers.

Good pouring properties, resistance to corrosion, and the mechanical properties of silicon-aluminum make that alloy an excellent one for cylinder heads, the more so because the serrated texture of its grain and the absence of any cracking tendency make it comparatively easy to obtain sound castings. The elastic limit of this alloy (Alpax) is increased either by the addition of 0.8 per cent copper and 0.5 per cent manganese, or of 0.25 per cent magnesium and 0.5 per cent manganese.

If the cylinder head is subjected to more severe stresses it becomes necessary to have recourse to alloys that are responsive to heat treatment, such as γ Alpax, the Y alloy, or alloys of the RR type.

The principal difficulties encountered by foundrymen when casting aluminum cylinder heads result from the fact that the mold for the latter comprises a core completely surrounded by metal, which core serves to form the water jacket. When the casting is poured, this core always gives off gas, and it is necessary to reduce this emission of gas to the minimum by a suitable choice of binder, by prolonged drying of the cores and by proper venting, so that the gas will not force its way through the molten metal and cause porous spots. The technique to be followed is at present well known to manufacturers who turn out these cylinder heads in large numbers and with a minimum number of rejects.

A number of different foundry methods have been worked out in which more or less of the outer surface of the head is chill-cast. Most frequently use is made of a heavy cast iron plate (1.2 to 1.6 in. thick) on which the form of the combustion chamber is carried in relief, in order to produce the joint surface and the combustion-chamber surface. By this method water-tight combustion chambers are obtained which are very accurate in volume, and the smooth surfaces of which prevent the formation of hot spots. From 9000 to 10,000 Ford pistons per day are produced by this method.

In following out this idea, metal molds were produced for the cylinder heads in which five of the six surfaces of the part are cast on metal plates. The sixth surface is purposely cast on sand, in order to be able to provide for suitable risers and for a better escape of the gases from the core. This method offers certain advantages in connection with cylinder heads for valve-in-head engines, in which there are several tiers of cores, for the water jacket and for the intake and exhaust passages. All of these cores, moreover, are rigid with the large upper core on which the sprues and risers are formed.

British Cast Cylinder Heads in Metal Molds

British manufacturers for some years have cast cylinder heads in molds completely made of metal, the cope being provided with openings through which the metal is poured. Some of these molds open like a book, and after the core has been put in place the metal mold is closed up and the casting poured.

In most cases the simple substitution of aluminum for cast iron permits of a sufficient increase in the compression ratio to obtain an appreciable gain in power and economy. Most manufacturers, when they first turned to aluminum for their cylinder heads, used the same patterns they had been using for iron heads. This procedure enabled them to save time and to obviate the cost of new patterns. It has been found that the turbulence-type head retains the same superiority over the quiescent head when cast in aluminum as when cast in iron. A profound study of phenomena of self-ignition and detonation resulted in certain designs of combustion chamber which permitted of further improving the aluminum head by taking better advantage of the heat conductivity of the light metal.

In a design patented by M. Darche account is taken of the fact that detonation is due to that part of the gaseous charge which burns last, and that to avoid detonation this portion of the charge must be cooled energetically. In this design the combustion chamber consists of two communicating cells. Combustion starts in the first of these while the portion of the charge which burns last is contained in the second cell, which latter is energetically cooled by water, and the gases are further cooled by being given a swirling motion within the chamber. This latter cell, moreover, is adjustable with respect to capacity and the owner can adjust it to the compression ratio best suited to the fuel employed by him.

In the Serruys "striated" cylinder head, the under side of the head over the region of small clearance is formed with fins, which make it easier for the gases to give up their heat to the combustion-chamber wall. This arrangement would be impracticable with a metal of low heat conductivity, as hot spots would form which would promote detonation instead of preventing it.

In the past, aluminum heads for valve-in-head engines have been used mainly on aircraft engines, but a number of automobile manufacturers recently have attacked the problem. The difficulties are due to the fact that such a cylinder head is a much more complicated casting. While it is possible to increase the compression ratio when aluminum is used for a head of this type, the permissible increase is not as great as with an L-head engine, which seems to be due to the fact that the volumetric efficiency is greater in the valve-in-head engine.

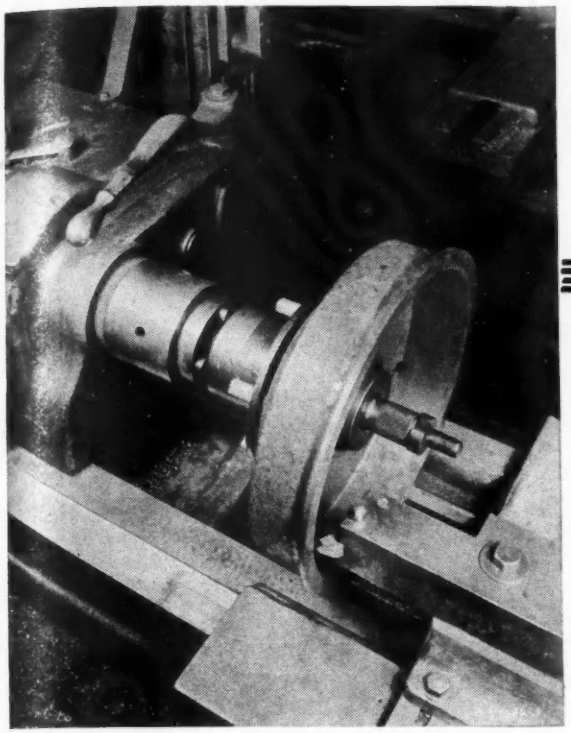
Silicon-Aluminum Preferred for L-Head Engines

While the same alloys may be used for cylinder heads for valve-in-head as for L-head engines, silicon-aluminum alloys seem to be preferred over copper-aluminum alloys for this purpose, both by reason of their good casting qualities and the assurance they give against cracking.

The problem of valve-seat inserts for aluminum heads has been fully solved. Use is made of aluminum bronze, cast irons or austenitic steels, according to the circumstances of the particular case. A good aluminum bronze for the purpose has the following composition: 80 per cent copper, 11 per cent aluminum, 4.5 per cent iron, and 4.5 per cent nickel. This alloy has a Brinell hardness of 220 to 250, it maintains its strength well at high temperatures, and its coefficient of heat expansion is 0.00000945 (per deg. F.). Where ethyl gasoline is to be used it has been found preferable to make the inserts of cast iron or austenitic steel. Among the cast irons used, mention may be made of copper-nickel cast iron (Ni-Resist) used mainly in the U. S., which has a Brinell hardness as high as 180 and the mean coefficient of heat expansion of which between 68 and 575 deg. F. is 0.00001. Among the steels used for the purpose, a silico-manganese steel with an expansion coefficient of 0.000012 between 32 deg. and 1100 deg. F. has a high resistance to crushing at high temperatures.

Various methods are employed for securing the inserts in place. Some of these take advantage of the good casting properties of aluminum alloys, and particularly of the silicon-aluminum alloy, by placing the inserts in the mold. In addition to its simplicity, this method offers the advantage that it assures a better anchorage for the insert than can be obtained by any other method. It is possible, for instance, to taper the outside surface of the insert, making the difference between top and bottom diameters of the order of 0.040 in. for a diameter of 2.75 in. Another plan, which has been followed by Krupp in air-cooled engines, consists in giving the inserts an inverted U section, which is still better from the point of view of a secure anchorage. However, in the majority of cases the inserts are fitted mechanically by providing for an interference of anywhere between 0.006 in. and 0.012 in. According to the degree of interference specified, the cylinder block or head is heated to 300-500 deg. F. or the inserts are chilled in dry ice or liquid air, or the two methods are used together. In the case of passenger-car engines the shrink-fit allowance need not be more than 0.006 in. and a moderate heating of the block or a moderate cooling of the insert will serve. This method, moreover, is inexpensive and it is the general practice in the U. S. in connection with L-head engines.—*Revue de l'Aluminium* for November, 1935.

PRODUCTION LINES



The last fine finishing cut being taken on the brake drum while it is mounted securely to the wheel hub assembly at the Dodge truck plant. The purpose of truing the drum in this manner on the hub assembly is to insure that all circumferences are concentric.

Framed Structures

Have you considered the possibilities that lie in a tubular body structure for cars, buses, and trucks? It offers the best opportunity of reduced weight without sacrifice of strength or rigidity. And on passenger cars, at least, the tubular framing will permit building production jobs without chassis frame. We were shown the projected design of such framing several days ago and it certainly looks good. While there is nothing particularly novel in this suggestion since it is already in use on the Stout Scarab and the Garwood bus, the proposed design offers better and more economical production techniques. One organization is working on the development of a unique welding process which makes it possible to frame the whole structure in a master fixture and weld all the joints in one setting, automatically. If this becomes commercially available, nothing can stop the tubular frame.

Lube Aids

Alox has started distribution of technical bulletins dealing with specific applications of Alox additions to engine lubricants. The first of the series—A-36, B-36, C-36, and E-36—have just come over our desk. Bulletin A-36 is of unusual interest as it discusses the use of Alox additions in Diesel fuels to serve as a lubricant for the injection system and thus increase the range of trouble-free service. According to Dr. Burwell, preliminary tests indicate that this addition also has the effect of raising the cetane number of the fuel, thus improving engine operation. Dr. Burwell will be glad to place your name on his mailing list, and we'll help if you are interested.

Brass Wire

Scientific data on brass wire and wire products supplemented by engineering data tables will be found in a new spiral-bound handbook issued by the Copper Development Assn. A separate section has been devoted to the production and treatment of copper alloy wire. And in general we can recommend this booklet as being one of practical value to any of our readers.

Good Seeing

We have been so impressed with the value of Dr. Luckiesh's recent work in the field of seeing that our attention has been attracted by specific examples in many plants where the application of his principles can be used to produce much good. For example, there are many places where contrast in lighting is so poor as to affect not only the quality of the work, but also induce fatigue on the part of the operator. A specific case is the usual inspection station for accurate checking of small metal parts. Those we have seen recently have a sheet metal table, highly polished by frequent use. There is practically no contrast between the work and the table, and in addition you find a harmful glare which must affect the accuracy of the operator. Try substituting a darker, non-reflecting table so as to place the emphasis of the light source directly on the work piece. It may do wonders.

By Honing

The honing technique that began with the finishing of cylinder bores has made some big strides into the byways of metal finishing. We were told the other day of a large scale job where honing is being used to finish helically-cut splines on a transmission shaft. The car manufacturer tried grinding originally but without much success—then along came the honing engineer and worked out a very tricky but economical way of doing it with abrasive sticks.

Air Cooled

One of the air-conditioning experts around town tells us that his company recently installed a forced cooling system for a large forge shop. In this set-up they used individual jets of air under pressure located directly at each man's station. Incidentally, the jets are adjustable to suit the individual. This has made a lot of difference in the comfort of the men working in the extremely hot atmosphere of a forge shop.

Road Tested

You are familiar, no doubt, with the Belgian block stretch at the G.M. proving grounds which has been used for punishing the new models. Recently this course was used to give the "third degree" to a new type of cab developed for the 1936 G.M.C. truck line. They figure that if the cab has graduated from the Belgian block, it's good enough for any truck service, no matter how severe.—J. G.

MANUFACTURING MANAGEMENT METALLURGY

American Passenger Car Engine Trends

(Based on Number of Models Offered)

Displacement per Cylinder

	Cu. in.
1927	39.5
1928	39.1
1929	38.9
1930	37.6
1931	36.8
1932	36.7
1933	36.0
1934	36.2
1935	36.1
1936	35.6

Average Compression Ratio

1925	4.44
1926	4.47
1927	4.55
1928	4.86
1929	4.99
1930	5.15
1931	5.23
1932	5.29
1933	5.57
1934	5.72
1935	5.98
1936	6.14

Average Bore—Stroke Ratio

1925	1.36
1930	1.38
1931	1.39
1932	1.35
1933	1.36
1934	1.36
1935	1.36
1936	1.27

Hp. per cu. in. of Displacement

1925	.233
1926	.236
1927	.256
1928	.276
1929	.306
1930	.331
1931	.344
1932	.353
1933	.376
1934	.388
1935	.398
1936	.411

Average B.M.E.P.

At Maximum HP.

	Lb. per sq. in.
1927	74.5
1928	76.2
1929	80.6
1930	82.7
1931	84.3
1932	86.2
1933	88.5
1934	90.1
1935	90.2
1936	92.3

Average R.P.M.

1927	2740
1928	2860
1929	3063
1930	3170
1931	3230
1932	3250
1933	3360
1934	3420
1935	3480
1936	3487

Number of Cylinders

	Per Cent 4 Cyl.	Per Cent 6 Cyl.	Per Cent 8 Cyl.	Per Cent 12 Cyl.	Per Cent 16 Cyl.
1922	30.8	59.1	9.5	0.6	...
1923	22.1	66.9	10.4	0.6	...
1924	19.5	70.3	10.2	...	...
1925	14.8	67.8	17.4	...	...
1926	13.00	66.0	21.0	...	...
1927	6.00	65.0	29.0	...	...
1928	6.50	58.0	35.5	...	...
1929	4.00	55.00	41.00	...	...
1930	2.92	43.20	52.70	...	0.98
1931	3.85	30.80	61.50	1.28	2.57
1932	4.20	30.60	54.20	8.30	2.70
1933	5.70	30.00	51.50	10.00	2.80
1934	4.68	31.20	48.50	12.50	3.12
1935	3.50	37.90	50.00	6.90	1.70
1936	3.50	42.10	43.89	8.77	1.74

Piston Material

	Per Cent Cast Iron	P.C. Aluminum With Struts	P.C. Aluminum No Struts	Total Aluminum	Steel
1923	79.1	...	...	20.9	...
1924	76.0	...	...	24.0	...
1925	73.3	...	...	26.7	...
1926	76.0	...	...	24.0	...
1927	66.7	...	...	33.3	...
1928	43.4	45.8	10.8	56.6	...
1929	25.8	48.4	25.8	74.2	...
1930	21.55	61.7	16.65	78.35	...
1931	20.50	53.8	25.70	79.50	...
1932	28.00	50.0	22.00	72.00	...
1933	25.80	45.60	28.60	74.20	...
1934	17.20	43.80	39.00	82.80	...
1935	18.90	36.20	44.90	81.10	...
1936	10.71	30.36	57.14	87.50	1.79

Valve Location

	Per Cent L-Head	Per Cent Valve-in-Head	Per Cent Horizontal	Per Cent Sleeve	Per Cent T-Head	Per Cent F-Head
1922	63.0	29.9	0.6	3.9	2.0	0.6
1923	61.9	29.6	...	4.6	2.6	1.3
1924	61.9	28.8	...	5.1	3.4	0.8
1925	70.2	20.5	...	5.6	2.8	0.9
1926	73.5	17.30	...	5.1	3.1	1.0
1927	76.70	14.20	...	5.1	3.0	1.0
1928	76.60	14.00	...	5.6	2.8	...
1929	78.00	14.00	...	6.00	1.00	1.00
1930	84.33	11.75	1.96	1.96	...	...
1931	79.50	17.94	1.28	1.28	...	...
1932	74.00	19.20	4.10	2.70	...	...
1933	70.00	25.71	2.86	1.43	...	...
1934	65.7	31.20	3.10	...	...	...
1935	75.90	22.40	1.70	...	...	...
1936	80.36	19.64	...	...	...	...

Bore, Stroke, Displacement

	Bore (Inches)	Stroke (Inches)	Piston Displ. (Cu. In.)
1922	3.46	4.92	260.5
1923	3.43	4.81	257.3
1924	3.43	4.81	258.1
1925	3.48	4.73	262.6
1926	3.37	4.72	260.59
1927	3.26	4.67	254.86
1928	3.27	4.58	257.73
1929	3.27	4.57	261.27
1930	3.26	4.51	264.59
1931	3.21	4.45	273.00
1932	3.26	4.41	283.93
1933	3.23	4.40	284.07
1934	3.24	4.40	289.18
1935	3.23	4.39	271.40
1936	3.39	4.32	267.90

Timing Drives

	Per Cent Chain	Per Cent Gear
1922	27.8	72.2
1923	35.1	64.9
1924	43.5	56.5
1925	47.0	53.0
1926	64.0	36.0
1927	75.7	24.3
1928	79.2	20.8
1929	84.8	15.2
1930	85.7	14.3
1931	83.1	16.9
1932	85.7	14.3
1933	80.0	20.0
1934	76.2	23.8
1935	74.1	25.9
1936	79.0	21.0

Average Piston Speeds

	Feet per Min.
1927	2150
1928	2210
1929	2310
1930	2380
1931	2395
1932	2390
1933	2463
1934	2508
1935	2535
1936	2498

Average Number of Cylinders

1927	6.45
1928	6.59
1929	6.71
1930	7.04
1931	7.49
1932	7.78
1933	7.88
1934	7.97
1935	7.51
1936	7.50

Average Brake Horsepower

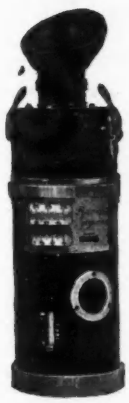
1927	65.8
1928	70.9
1929	81.6
1930	87.6
1931	95.0
1932	101.0
1933	106.5
1934	112.5
1935	109.6
1936	110.1

(NOTE: Derived from data on pages 254-255, Statistical Issue, AUTOMOTIVE INDUSTRIES, Feb. 22, 1936.)

NEW DEVELOPMENTS
Automotive Parts, Accessories and Production Tools

High Temperatures Quickly Measured

The measurement of high temperatures with the Pyro optical pyrometer is made by comparing and balancing the brightness of the hot body with that of a calibrated electric lamp. The rapid increase of the photometric intensity of the light emitted by a hot body, in comparison with that of the temperature, is said to make it possible to determine the temperature accurately by matching the brightness of the light rather than the color. In this instrument the apparent brightness of the glowing body is matched with a standard light of constant intensity. The latter can be quickly checked by means of the ammeter provided to standardize on the current passing through the filament. A standard flashlight battery is used as a source of current.

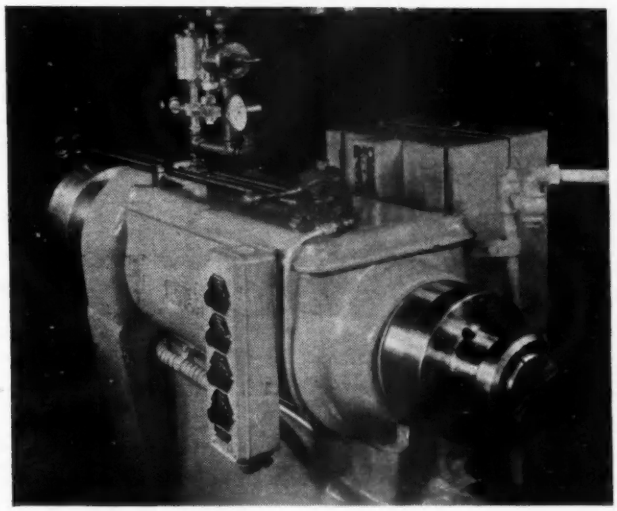


Measures Temperature

The Pyro optical pyrometer, a product of The Pyrometer Instrument Co., 103 Lafayette St., New York, is supplied in ranges from 1400 deg. Fahr. to 7500 deg. Fahr.

Starting Switch for Diesel Engines

A new series-parallel starting switch, designed and engineered particularly for Diesel engines, has just been added to the Delco-Remy line of electrical equipment. This switch is used in connection with a 12-volt generator, two 12-volt storage batteries and a 24-volt starting motor. Normally, the two batteries are connected in parallel to provide 12 volts for the ignition, lights, etc., but when the switch is depressed this parallel connection is broken to make a series connection for starting. During the starting operation, the 12-volt circuit is maintained by one battery, so there is no interruption. A 24-volt solenoid is used to close the starter circuit in addition to this starting switch. This equipment is being supplied by the Delco-Remy Corp., Anderson, Ind.



Push Button Control on Gisholt Lathe

New Gisholt Lathe For High Speed Work

A simplified, high speed turret lathe developed for a wide range of both ferrous and non-ferrous material machining jobs has been announced by the Gisholt Machine Co., Madison, Wis. An interesting feature of this machine is its drive. The spindle, which is mounted on tapered roller bearings, is driven by V belts directly from the motor mounted in the cabinet under the headstock. The belt sheave is so arranged that it can be quickly removed and replaced by another of different diameter. Control of the spindle is by means of a push button panel on the headstock.

The hexagon turret and its stop roll are automatically indexed to the next position with a back movement of the slide, and as the slide advances to the work, the hexagon turret is automatically located and clamped in place.

The newly designed bed and headstock are cast from nickel semi-steel in one rigid casting. The bed is composed of three heavily walled box sections which are reenforced with eight sets of heavy X side ribs. The machine has a maximum of 18½ inch swing over the steel topped ways.

Telephone booth for steel mills

Telephone Booth Shuts Out Factory Noises

Telephone conversations are now said to be possible in steel mills, forging plants, etc., where extraneous noises formerly made this impossible. The Acoustic Division of the Burgess Battery Co., Madison, Wis., has developed a new type of phone booth in which the interior is faced with Burgess Acoustic Treatment, a perforated metal sheet backed with balsam wool. As will be seen from the cut, no door is necessary as this lining material is said to deaden extraneous sounds by absorbing them.

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◆ BUYERS' GUIDE ◆

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See Alphabetical List of Advertisers on page 36

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